IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

JUANA DOE I et al.,	§	
	§	
Plaintiffs,	§	
	§	
vs.	§	
	§	C.A. No. 17-1494-VAC-SRF
IFC ASSET MANAGEMENT COMPANY, LLC,	§	
	§	
	§	
Defendant.	§	

[PROPOSED] ORDER

WHEREAS, Defendant IFC Asset Management Company, LLC, having moved to dismiss the claims in Plaintiff Juana Doe I *et al*.'s Complaint (D.I. 1); and,

WHEREAS, the Court having considered the briefs and arguments in support of and in opposition to said Motion;

IT IS HEREBY ORDERED this _____ day of _____, 2018, that the Motion is GRANTED. Plaintiffs' Complaint is dismissed with prejudice.

_____
United States District Judge

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Defendant.	§	

DEFENDANT'S OPENING BRIEF IN SUPPORT OF THEIR MOTION TO DISMISS

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NATURE & STAGE OF THE PROCEEDINGS

Plaintiffs served the registered agent for IFC Asset Management Company, LLC ("IFC AMC") with a copy of the complaint on October 31, 2017. D.I. 7. IFC AMC moved to stay the deadline for filing a motion to dismiss pending resolution of a motion to transfer. D.I. 17. On January 8, 2018, the Court denied IFC AMC's motion to stay briefing. D.I. 27. Briefing on IFC AMC's motion to transfer is complete. D.I. 23–25, 28, 31.

SUMMARY OF ARGUMENT

For all of its length, historical narrative, and detail, Plaintiffs' complaint nonetheless fails to allege a single claim against IFC AMC where this Court has subject matter jurisdiction or where there is a plausible claim for relief. Accordingly, this Court may dismiss the complaint with prejudice for five separate reasons. First, this Court lacks subject matter jurisdiction over the complaint because IFC AMC is immune from suit under its founding treaty and federal law. Second, the connection between Plaintiffs' injuries and IFC and IFC AMC's conduct is so tenuous that it fails to meet the irreducible minimums of Article III standing. Third, by bringing suit against IFC AMC, Plaintiffs have omitted indispensable third parties that cannot be joined to the case. Fourth, IFC and IFC AMC's role in the alleged tortious conduct is too remote to support any plausible theory of liability. Fifth, the statute of limitations is an inevitable barrier to Plaintiffs' claims. Sixth, *forum non conveniens* applies because Honduran courts are an available and adequate forum to resolve these claims.

FACTUAL BACKGROUND

I. IFC AND IFC AMC

The International Finance Corporation ("IFC") is a public international organization whose purpose is to "further economic development by encouraging the growth of productive private enterprise in member countries." Ex. A, Articles of Agreement of the International Finance

Corporation art. I, Dec. 5, 1955, 7 U.S.T. 2197 ("Articles of Agreement"). IFC, a member of the World Bank Group, is governed by its Articles of Agreement, which provide, among other things, that IFC will have privileges and immunities that enable it to "fulfill the functions with which it is entrusted" around the world. Article VI, § 1. The United States was a founding member of IFC and Congress authorized the President to accept membership for the United States in the organization. 22 U.S.C. § 282. Pursuant to the International Organizations Immunities Act of 1945 ("IOIA"), 22 U.S.C. § 288, and the statutes that pertain explicitly to IFC, 22 U.S.C. §§ 282–282n, the President designated IFC through Executive Order as a "public international organization entitled to enjoy the privileges, exemptions, and immunities conferred" by the IOIA. Exec. Order No. 10,680, 21 Fed. Reg. 7647 (Oct. 5, 1956).

IFC AMC is a wholly-owned subsidiary of IFC created in 2009 to raise money to invest alongside IFC in private enterprise and manage funds from IFC and other institutional investors. D.I. 1 ¶¶ 77, 79–80. IFC's CEO chairs IFC AMC's board and IFC approves the appointment of all IFC AMC board members. D.I. 1 ¶ 81. IFC AMC only considers investments that have been approved by IFC and the investments must comply with IFC's requirements. D.I. 1 ¶ 83. All investments are processed, executed, and managed jointly by IFC and IFC AMC investment teams. D.I. 1 ¶¶ 81.

II. PLAINTIFFS' ALLEGATIONS

According to the Complaint, Plaintiffs are farmers and residents of the Bajo Aguán area of northeastern Honduras. D.I. 1 ¶ 104. Beginning in the 1970s, farmer cooperatives obtained title to farmland in the area and began cultivating palm oil. *Id.* ¶ 105–07. In the 1990s, the Honduran government instituted land modernization laws that permitted the sale or lease of the farmlands. *Id.* ¶ 111. During this period, Miguel Facussé used coercive and aggressive tactics to purchase

dozens of farms from the cooperatives and organized these holdings into large palm plantations. *Id.* ¶ 114. Once acquired, the plantations were owned and managed by Facussé's company, Cressida. *Id.* ¶ 136. Soon after Facussé acquired the farmlands in the 1990s, the farmer cooperatives began challenging the propriety of the land transfers. The cooperatives filed lawsuits in 1998 seeking to annul the title transfers, though the lawsuits were abandoned by the plaintiffs. *Id.* ¶ 133. The cooperatives also began pressuring the government to resolve the conflict and used the tactic of occupying disputed parcels of land. *Id.* ¶¶ 137, 179, 180. After Facussé sold most of Cressida's assets and product lines (excluding the palm plantations), Cressida became Corporación Dinant ("Dinant"). *Id.* ¶ 136.

Around 2009, the land conflict between the farmer cooperatives and Dinant intensified. *Id.* ¶¶ 201–03. In particular, Plaintiffs allege that Dinant's security forces are responsible for a campaign of violence against Plaintiffs and the farmer cooperatives. *Id.* ¶¶ 455–71. Plaintiffs define Dinant's security forces to include its own security guards, third-party security contractors, the Honduran military, the Honduran police, and "paramilitary death squads." *Id.* ¶ 91. Based on the sale of the farmland in the 1990s and the alleged acts of violence committed by Dinant's security forces, Plaintiffs assert against IFC AMC claims for wrongful death, battery, assault, intentional infliction of emotional distress, false imprisonment, negligent infliction of emotional distress, negligence, trespass, and unjust enrichment.

III. IFC AND IFC AMC'S INVESTMENTS WITH DINANT AND BANCO FICOHSA

Neither IFC nor IFC AMC played any role in the tortious conduct alleged in Plaintiffs' complaint. Regardless, Plaintiffs allege that IFC AMC is liable for their injuries because IFC and IFC AMC made the following investments in Honduras:

- In 1997, IFC made a $55 million investment in Cressida. D.I. 1 ¶¶ 87, 95. The investment consisted of a $45 million loan and a $10 million equity stake. D.I. 1 ¶ 95. When Cressida was sold to a European conglomerate in 2001, Cressida repaid IFC's loan. *Id.*
- In April 2009, IFC approved a $30 million loan to Dinant, of which $15 million was disbursed in November 2009. D.I. 1 ¶ 10.
- In 2011, IFC AMC made a $70 million investment in Banco Ficohsa, the largest bank in Honduras. D.I. 1 ¶¶ 15-16. IFC had previously made a $20 million loan to Ficohsa. D.I. 1 ¶ 98. As part of the 2011 investment, IFC AMC made a $38 million loan to Ficohsa and took a 10 percent ownership stake in exchange for $32 million. D.I. 1 ¶¶ 15–16, 99. In 2014, IFC AMC acquired additional equity in exchange for $5.5 million. D.I. 1 ¶ 100.
- In November 2013, IFC guaranteed $5.3 million in loans that Ficohsa made to Dinant for "intra-firm" trades through Ficohsa's Global Trade Finance Program. D.I. 1 ¶ 17.

ARGUMENT

I. THE COURT LACKS SUBJECT-MATTER JURISDICTION OVER PLAINTIFFS' CLAIMS BECAUSE IFC AMC IS IMMUNE FROM SUIT

The allegations contained in Plaintiffs' complaint make clear that dismissal pursuant to Rule 12(b)(1) is appropriate because IFC AMC is immune under both IFC's founding treaty (the Articles of Agreement) and separately under the IOIA. *See Davis v. Wells Fargo*, 824 F.3d 333, 346 (3d Cir. 2016) (standard for facial challenge to jurisdiction under Rule 12(b)(1)). As a wholly-owned subsidiary of IFC that carries out its purpose and mission, IFC AMC enjoys the same immunities from suit and judicial process as IFC. *See Jam v. Int'l Fin. Corp.*, 860 F.3d 703, 705 (D.C. Cir. 2017), *petition for cert. filed*, *Jam v. Int'l Fin. Corp.* (No. 17-1011) (dismissing suit against IFC under Rule 12(b)(1) because IFC is immune from suit); *In re Kaiser Grp. Int'l Inc.*, 399 F.3d 558, 560 n.1 (3d Cir. 2005) ("As a public international organization, IFC is entitled to

the privileges, exemptions, and immunities conferred by the International Organizations Immunities Act . . . .").

In this case, IFC's, and therefore IFC AMC's, immunity derives from two distinct sources, both of which are recognized under federal law. First, pursuant to IFC's Articles of Agreement—which Congress gave "full force and effect" when the United States joined the Corporation in 1955—IFC AMC is immune from suit absent waiver. Article VI, § 3; 22 U.S.C. § 282g. Second, the IOIA provides that IFC AMC is immune from suit to the same extent as any foreign government. 22 U.S.C. § 288a(b). Once IFC AMC has established its immunity under either theory, it is entitled to a presumption of immunity and the burden shifts to Plaintiffs to establish that there has been a waiver or an exception to immunity applies. *See Fed. Ins. Co. v. Richard I. Rubin & Co.*, 12 F.3d 1270, 1285 (3d Cir. 1993) (endorsing same framework in context of foreign sovereign immunity). Because neither is the case, dismissal is warranted.

A. IFC AMC shares in IFC's immunities because it is a wholly-owned subsidiary carrying out IFC's operations.

As an international organization operating in the United States—one of its member countries—IFC generally enjoys immunity from suit and judicial process pursuant to its Articles of Agreement and the IOIA. *E.g.*, *Jam*, 860 F.3d at 705. As a wholly-owned subsidiary, IFC AMC shares a "complete unity of interest" with IFC and its stated mission of promoting economic development through private investment. *Copperweld Corp. v. Indep. Tube Corp.*, 467 U.S. 752, 771 (1984). Moreover, it is fundamentally a matter of IFC's own discretion to establish a subsidiary like IFC AMC. *Watters v. Wachovia Bank, N.A.*, 550 U.S. 1, 19 (2007).

IFC's immunities thus extend to a wholly-owned subsidiary like IFC AMC, which IFC created in order to facilitate its own operations. IFC's immunities are meant to "enable [IFC] to fulfill the functions with which it is entrusted." Articles of Agreement, art. VI, § 1. If conducting

a portion of its operations through a subsidiary facilitates IFC's ability to fulfill its mission, then IFC's immunities extend to the operations, property, and assets of that subsidiary. There is no indication that the drafters of IFC's Articles or the IOIA intended for international organizations to lose their protected status whenever, as a matter of its own discretion, the organization establishes an affiliate to carry out some portion of its operations.

IFC AMC is unaware of any decision where a court has refused to extend the immunities of an international organization to an affiliate that the parent organization formed. In the context of the United Nations ("UN"), for example, courts routinely extend the UN's immunities to its subsidiary programs. *See Lempert v. Rice*, 956 F. Supp. 2d 17, 24 (D.D.C. 2013) (United Nations Development Program); *D'Cruz v. Annan*, No. 05-8918, 2005 WL 3527153, at *2 (S.D.N.Y. Dec. 22, 2005), *aff'd*, 223 F. App'x 42 (2d Cir. 2007) (United Nations Organization and United Nations Insurance Services); *Boimah v. United Nations Gen. Assembly*, 664 F. Supp. 69, 71 (E.D.N.Y. 1987) (UN General Assembly); *Shamsee v. Shamsee*, 74 A.D.2d 357, 361 (N.Y. App. Div. 1980), *aff'd*, 421 N.E.2d 848 (N.Y. 1981) (United Nations Joint Staff Pension Fund).

This result—finding that IFC AMC is immune to the same extent as IFC—is consistent with the underlying purposes of international organization immunity, which is meant to "protect international organizations from unilateral control by a member nation over the activities of the international organization within its territory." *Mendaro v. World Bank*, 717 F.2d 610, 615 (D.C. Cir. 1983). "Denial of immunity opens the door to divided decisions of the courts of different member states passing judgment on the rules, regulations and decisions of the international bodies." *Id.* at 616. Permitting federal courts to hear suits against IFC's subsidiary for actions undertaken in furtherance of IFC's mission is tantamount to disregarding IFC's immunity, which would expose IFC's operations to exactly the harms that support granting IFC immunity in the

first place. *See Askir v. Brown & Root Servs. Corp.*, No. 95 CIV. 11008 (JGK), 1997 WL 598587, at *6 (S.D.N.Y. Sept. 23, 1997) (holding that contractors who act under the authority and direction of the United Nations are immune because it would "make little sense to hold [a contractor] liable for performing the same sovereign acts for which the United Nations is itself immune").

The text of both the Articles of Agreement and the IOIA also support this conclusion. As a wholly-owned subsidiary, IFC AMC is an "asset" of IFC. *See Victor Hotel Corp. v. FCA Mortg. Corp.*, 928 F.2d 1077, 1083 (11th Cir. 1991) (wholly-owned subsidiary is an asset of a financial institution). And IFC AMC deploys the assets and property of IFC. D.I. 1 ¶ 79, 80. The Articles contemplate that IFC's immunities will extend to its assets. *E.g.*, Articles of Agreement, art. VI, § 3 (assets of IFC are "immune from all forms of seizure, attachment or execution" before final judgment); *id.* § 4 (assets are "immune from search, requisition, confiscation, expropriation or any other form of seizure"); *id.* § 6 (assets "shall be free from restrictions, regulations, controls and moratoria"). Similarly, the IOIA provides that "[i]nternational organizations, their property and their assets, wherever located, and by whomsoever held, shall enjoy the same immunity from suit and every form of judicial process as is enjoyed by foreign governments." 22 U.S.C. § 288a(b).

B. IFC AMC is immune under IFC's Articles of Agreement and neither IFC nor IFC AMC have waived that immunity.

Pursuant to IFC's Articles of Agreement, IFC AMC is immune from suit and legal process absent waiver. That immunity is enforceable under federal law and distinct from the immunity afforded to IFC and IFC AMC pursuant to the IOIA.

When Congress authorized the United States to join IFC in 1955, it provided that certain provisions of IFC's Articles of Agreement "shall have full force and effect in the United States and its Territories and possessions upon acceptance of membership by the United States in, and the establishment of, the Corporation." International Finance Corporation Act, Pub. L. No. 84-

350, § 9, 69 Stat. 669, 670 (1955) (codified at 22 U.S.C. § 282g). Among the provisions of the Articles that Congress gave "full force and effect" were those related to IFC's immunity from judicial process and suit. *See* 22 U.S.C. § 282g (citing Articles of Agreement, art. VI, §§ 2–9).[1]

IFC AMC's immunity under the Articles and 22 U.S.C. § 282g is independent from the immunity afforded to it under the IOIA at 22 U.S.C. § 288a. *See Nyambal v. Int'l Monetary Fund*, 772 F.3d 277, 281 (D.C. Cir. 2014) (discussing the "dual protections" afforded to the IMF via its Articles of Agreement and the IOIA); Exec. Order No. 10,680, 21 Fed. Reg. 7647 (Oct. 5, 1956) (noting that designation of IFC under the IOIA was "not intended to abridge in any respect privileges, exemptions, and immunities which such corporation may have acquired or may acquire by treaty or Congressional action"). While in many cases the scope of the immunity afforded by the Articles and the IOIA will be the same, they are still separate grounds of immunity. For this reason, *OSS Nokalva, Inc. v. European Space Agency*, 617 F.3d 756, 764 (3d Cir. 2010), is distinguishable and does not control. In *OSS Nokalva*, the Third Circuit concluded that the European Space Agency was not immune under the IOIA from claims related to a breach of contract because such claims fell within the commercial activities exception of the Foreign Sovereign Immunities Act ("FSIA").[2] *Id.* But the European Space Agency did not raise any

[1] The Articles referenced in § 282g state, among other things, that IFC's "property and assets . . . [are] immune from all forms of seizure, attachment or execution before the delivery of final judgment," Articles of Agreement, art. VI, § 3; that its "[p]roperty and assets . . . [are] immune from search, requisition, confiscation, expropriation or any other form of seizure by executive or legislative action," *id*. at § 4; that its archives are "inviolable," *id*. at § 5; that "all property and assets of the Corporation shall be free from restrictions, regulations, controls and moratoria of any nature," *id*. at § 6; that its official communications must be treated as official communications of a sovereign country, *id*. at § 7; and that its officers and employees are immune from legal process for acts performed in their official capacity, *id*. at § 8.

[2] The Third Circuit is an outlier in holding that the FSIA exceptions apply to the IOIA. The majority (and correct) view among courts is that the IOIA does not incorporate *any* elements of the later-enacted FSIA. *See Jam v. Int'l Fin. Corp.*, 860 F.3d 703, 706 (D.C. Cir. 2017); *Price v. Unisea, Inc.*, 289 P.3d 914, 920 (Alaska 2012). It is thus a well-established principle that

immunity defense based on its founding treaty and the Third Circuit's analysis was thus limited to the IOIA. Indeed, the United States is not a member of the European Space Agency, and thus never adopted that treaty into its domestic law as it has for IFC's Articles. *See* Ex. C, European Space Agency, *Annual Report 2015* 76 (July 13, 2017); 22 U.S.C. § 288f-1. Thus, *OSS Nokalva* does not speak to IFC AMC's immunities under the Articles.

In light of IFC AMC's immunities under the Articles, the only grounds for exercising subject matter jurisdiction would be a waiver of immunity by IFC or IFC AMC. *See* Article VI, § 3 Article VI, § 3 ("Actions may be brought against the Corporation only in a court of competent jurisdiction in the territories of a member in which the Corporation has an office, has appointed an agent for the purpose of accepting service of process, or has issued or guaranteed securities."). Neither the Third Circuit nor any court in this District has previously interpreted the waiver of IFC's immunity under its Articles. There is, however, a well-developed body of case law in the D.C. Circuit interpreting IFC's Articles that does not support a finding of waiver in this case.

The D.C. Circuit has read the waiver provision in IFC's Articles narrowly "to allow only the *type of suit* by the *type of plaintiff* that 'would benefit the organization over the long term.'" *Jam*, 860 F.3d at 706 (quoting *Osserian v. Int'l Fin. Corp.*, 552 F.3d 836, 840 (D.C. Cir. 2009)); *see also Vila v. Inter-Am. Inv. Corp.*, 570 F.3d 274, 279 (D.C. Cir. 2009) (interpreting identical language in the Inter-American Investment Corporation's Charter); *Atkinson v. Inter-Am. Dev. Bank*, 156 F.3d 1335, 1338 (D.C. Cir. 1998) (Inter-American Development Bank); *Mendaro*, 717

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international organizations have absolute immunity under the IOIA subject only to waiver by the organization. *See, e.g.*, *In re Dinastia, L.P.*, 381 B.R. at 519–20; *Ashford Int'l, Inc. v. World Bank Grp.*, No. 1:04-CV-3822-JOF, 2006 WL 783357, at *2 (N.D. Ga. Mar. 24, 2006); *Banco de Seguros del Estado v. Int'l Fin. Corp.*, No. 06 CIV. 2427 LAP, 2007 WL 2746808, at *4 (S.D.N.Y. Sept. 20, 2007). That said, any relationship between the FSIA and IOIA has no impact on the scope of IFC's immunities under the Articles of Agreement.

F.2d at 615 (World Bank); *In re Dinastia, L.P.*, 381 B.R. 512, 521 (S.D. Tex. 2007) (applying D.C. Circuit wavier analysis); *Bro Tech Corp. v. European Bank for Reconstruction & Dev.*, No. CIV.A. 00-2160, 2000 WL 1751094, at *2 (E.D. Pa. Nov. 29, 2000) (same). Based on this "corresponding benefit" test, the D.C. Circuit has held, for example, that IFC is not immune from promissory estoppel and breach of confidentiality claims raised in connection with a potential investment. *Osseiran v. Int'l Fin. Corp.*, 552 F.3d 836, 840 (D.C. Cir. 2009).

Applying this test to Plaintiffs' claims, neither IFC nor IFC AMC have waived their immunity for tort claims brought by persons who were allegedly harmed by the actions of third parties who received funding from the organizations. In *Jam*, the D.C. Circuit held that IFC had not waived immunity over nearly identical claims brought by Indian nationals alleging that IFC made construction loans to a power plant that caused damage to the surrounding community. *Jam*, 860 F.3d at 704, 706–07. The plaintiffs there argued that IFC would benefit over the long term by allowing third parties to hold IFC "to its stated mission and its own compliance processes." *Id.* at 707. The D.C. Circuit rejected this argument, noting that "claims that implicate internal operations of an international organization are especially suspect because claims arising out of core operations, not ancillary business transactions, would threaten the policy discretion of the organization." *Id.* at 708. The Court also found that if this type of case were allowed to proceed, "every loan the IFC makes to fund projects in developing countries could be the subject of a suit," while also creating a "strong disincentive" to use an internal review process to oversee contract compliance. *Id.*

For these same reasons, this is not the type of suit that would benefit IFC AMC. Plaintiffs' allegations regarding the CAO findings and IFC's compliance with its own processes address IFC's exercise of its policy discretion. Moreover, opening the floodgates to this type of litigation

would potentially deter IFC and IFC AMC from making investments and would thus interfere with IFC's core mission of furthering economic development. Accordingly, IFC and IFC AMC have not waived immunity under the Articles and this Court lacks subject matter jurisdiction over the complaint.

C. IFC AMC is also immune under the IOIA and Plaintiffs have failed to establish any applicable exception to IOIA immunity.

Because IFC AMC is immune from suit per the Articles of Agreement and 22 U.S.C. § 282g, this Court need not consider whether IFC AMC is also separately immune from suit under the IOIA. Nonetheless, the plain terms of the IOIA likewise require dismissal of the complaint. In 1956, the President designated IFC as an international organization subject to the immunities provided in the IOIA. Exec. Order No. 10,680, 21 Fed. Reg. 7647 (Oct. 5, 1956). Pursuant to that designation, IFC and IFC AMC "enjoy the same immunity from suit and every form of judicial process as is enjoyed by foreign governments, except to the extent that such organizations may expressly waive their immunity." 22 U.S.C. § 288a(b).

Plaintiffs allege three reasons why the IOIA would not deprive this Court of subject matter jurisdiction. None are persuasive, and Plaintiffs have thus failed to establish any applicable exception to IFC AMC's immunity under the IOIA.

First, Plaintiffs allege that IFC AMC is not protected by the IOIA because the President never designated it as an international organization. D.I. 1 ¶ 503. But IFC AMC's designation is immaterial when it is a subsidiary of IFC, an organization that the President designated as a qualifying international organization in 1956. Exec. Order No. 10,680, 21 Fed. Reg. 7647 (Oct. 5, 1956). There is also no support in the IOIA's text or existing case law for requiring international organizations to seek separate designations from the Executive Branch for each of its subsidiary operations. The IOIA, by its own terms, gives international organizations the flexibility to

organize their own affairs by extending immunity to the organization's "property and assets." 22 U.S.C. § 288a(b). In addition, IFC AMC is unaware of any court that has ever required separate designations for subsidiary organizations.

Second, Plaintiffs allege that IFC AMC is outside the scope of the IOIA because it "is incorporated in the state of Delaware and is a 'citizen of a State of the United States.' It is therefore excluded from any immunity otherwise provided by the plain terms of 28 U.S.C. § 1603(b)(3)." D.I. 1 ¶ 503. Section 1603(b)(3) is a part of the FSIA that defines an "agency or instrumentality of a foreign state" as, among other things, an entity that is not "a citizen of a State of the United States." Plaintiffs appear to be arguing that because IFC AMC is formed under Delaware state law, it is a "citizen of a State" and thus does not qualify as an agency or instrumentality of a foreign state under the FSIA. But § 1603(b)(3) simply defines for purposes of the FSIA what constitutes a foreign sovereign and an agency or instrumentality of a foreign state. 28 U.S.C. § 1603. Nothing in *OSS Nokalva* suggests that the IOIA incorporates these definitions, particularly when the IOIA has its own set of governing definitions. *See* 22 U.S.C. § 288a.

Third, Plaintiffs allege that their claims fall within the commercial activities exception to foreign sovereign immunity. 28 U.S.C. § 1605(a)(2); D.I. ¶ 504. Under the exception, a foreign state lacks immunity when:

> the action is based [1] upon a commercial activity carried on in the United States by the foreign state; or [2] upon an act performed in the United States in connection with a commercial activity of the foreign state elsewhere; or [3] upon an act outside the territory of the United States in connection with a commercial activity of the foreign state elsewhere and that act causes a direct effect in the United States.

28 U.S.C. § 1605(a)(2). Plaintiffs allege that their lawsuit is based upon (1) IFC AMC's commercial activity carried on in the United States and/or (2) an act performed in the United States in connection with a commercial activity elsewhere. D.I. 1 ¶ 504. Both grounds for invoking the

commercial activities exception fail for the same reason: Plaintiffs' claims are based upon the alleged intentional acts of third parties, not IFC AMC's commercial activities.

The Supreme Court has explained that, within the context of § 1605(a)(2), "an action is 'based upon' the 'particular conduct' that constitutes the 'gravamen' of the suit." *OBB Personenverkehr AG v. Sachs*, 136 S.Ct. 390, 396 (2015) (quoting *Saudi Arabia v. Nelson*, 507 U.S. 349, 357 (1993)). The "gravamen" is the "basis" or "foundation" of a claim. *Id.* at 395 (quoting *Nelson*, 507 U.S. at 357). The term "based upon" thus "calls for something more than a mere connection with, or relation to, commercial activity." *Nelson*, 507 U.S. at 358. "[T]he commercial activity undertaken by the defendant must be directly connected to the cause of action alleged by the plaintiff." *Fed. Ins. Co.*, 12 F.3d at 1289; *see also Transatlantic Shiffahrtskontor GmbH v. Shanghai Foreign Trade Corp.*, 204 F.3d 384, 390 (2d Cir. 2000) (degree of closeness between the commercial activity and the gravamen of the complaint must be "considerably greater than common law causation requirements").

The gravamen of Plaintiffs' complaint is clear: Plaintiffs claim that they have been injured by Dinant's alleged campaign of terror and their claims are, at their core, claims for tortious injuries caused by Dinant. *E.g.*, D.I. 1 ¶ 1 (Plaintiffs seek damages and injunctive relief "to remedy murders, torture, assault, battery, trespass, unjust enrichment and other acts of aggression, committed, sponsored, and abetted by [Dinant]"); ¶ 5 ("Plaintiffs and their decedents are among the scores of farmers . . . that have been shot, killed, and terrorized by Dinant and those working on its behalf."). These tortious activities are not commercial activities (nor are they activities undertaken by IFC AMC). While Plaintiffs allege that IFC AMC is liable for injuries caused by Dinant because of the investments IFC and IFC AMC made in Dinant and Ficohsa, *id.* ¶¶ 380–454, the investments themselves are separate events that are not the gravamen of Plaintiffs' suit.

Permitting Plaintiffs to sue IFC AMC because IFC AMC invested in Banco Ficohsa (which loaned money to Dinant, which hired public and private security forces who allegedly harmed Plaintiffs) would stretch the boundaries of the commercial activities exception beyond recognition. *See Leutwyler v. Office of Queen Rania Al Abdullah*, 184 F. Supp. 2d 277, 299 (S.D.N.Y. 2001) (court should "ascertain the claim's gravamen to determine whether the FSIA plaintiff is simply using creative nomenclature as a semantic ploy to shroud the true essence of its theory and obtain jurisdiction over a claim that Congress did not intend to be brought against a foreign sovereign") (citation omitted). Along these lines, other courts have rejected similar attempts to bootstrap tort claims into claims "based upon" commercial activities. *See O'Bryan v. Holy See*, 556 F.3d 361, 377–80 (6th Cir. 2009) (denying applicability of exception to claims brought by sexual abuse victims where plaintiffs alleged that Holy See was acting in a commercial capacity); *Randolph v. Budget Rent-A-Car*, 97 F.3d 319, 324 (9th Cir. 1996) (dismissing negligence brought against Saudi Arabia because it provided scholarship to student who negligently crashed a rented car); *Fagan v. Deutsche Bundesbank*, 438 F. Supp. 2d 376, 390 (S.D.N.Y. 2006) (holding that exception did not apply to defamation claim brought against Germany's central bank that made statements about plaintiffs in various publications).

Finally, *OSS Nokalva*, 617 F.3d 756, provides Plaintiffs no assistance in supporting a commercial activities exception. In *OSS Nokalva*, the Third Circuit held that an international organization was not immune under the commercial activities exception for claims arising out of an alleged breach of contract between an international organization and a private corporation. *Id.* at 764. In that case, a breach of contract for software services was the gravamen of the suit and went directly to the commercial activities of the international organization. Here, there is no

breach of contract, no privity of contract, or, for that matter, any direct contact between Plaintiffs and IFC AMC.

II. PLAINTIFFS LACK ARTICLE III STANDING

Subject matter jurisdiction is also lacking in this case because Plaintiffs have failed to establish the requisite elements for Article III standing. "To establish Article III standing, a plaintiff must demonstrate (1) an injury-in-fact, (2) a sufficient causal connection between the injury and the conduct complained of, and (3) a likelihood that the injury will be redressed by a favorable decision." *Finkelman v. Nat'l Football League*, 810 F.3d 187, 193 (3d Cir. 2016) (citation omitted). Furthermore, "[t]he burden to establish standing rests with the plaintiffs." *Id.* Even affording a liberal reading to their allegations, there is an insurmountable causal chasm between the injuries alleged in Plaintiffs' complaint and IFC AMC's conduct. Accordingly, Plaintiffs' injuries are not "fairly traceable" to the conduct of IFC AMC. In addition, Plaintiffs lack third party standing to bring an unjust enrichment claim on behalf of the farmer cooperatives.

A. Plaintiffs' injuries are not fairly traceable to IFC and IFC AMC's conduct.

In order to establish a sufficient causal connection, the alleged injury must be "fairly traceable to the challenged action of the defendant, and not the result of the independent action of some third party not before the court." *Finkelman*, 810 F.3d at 193 (quoting *Toll Bros., Inc. v. Twp. of Readington*, 555 F.3d 131, 137–38 (3d Cir. 2009)). An injury is not "fairly traceable" to a defendant if it is the consequence of "several intervening actions by independent individuals" and is not the "natural consequence[]" of the defendant's action. *City of Philadelphia v. Beretta U.S.A., Corp.*, 126 F. Supp. 2d 882, 897 (E.D. Pa. 2000), *aff'd*, 277 F.3d 415 (3d Cir. 2002).

In *City of Philadelphia*, for example, the Third Circuit found there was an insufficient "causal nexus" to give rise to Article III standing where civic organizations alleged that gun

manufacturers' marketing and distribution of firearms permitted handguns to fall into the hands of criminals and children, which contributed to their criminal use in Philadelphia, which caused the organizations to increase spending on programs to counteract gun violence. 277 F.3d at 419 n.3. The alleged harms were not "fairly traceable" to the gun manufacturers but rather followed a "circuitous route" beginning with the gun manufacturer's lawful sale of firearms but interrupted by independent, intervening conduct, including criminal activity. 126 F. Supp. 2d at 896–97; *see also Allegheny Gen. Hosp. v. Philip Morris, Inc.*, 228 F.3d 429, 434 (3d Cir. 2000) (rejecting antitrust standing where claims premised on theory that cigarette manufacturers engaged in a conspiracy to manipulate nicotine content and mislead the public, which caused tobacco-related illnesses, which caused hospitals to expend resources to treat them, which caused hospital losses when patients did not pay medical bills).

As in *City of Philadelphia*, the causation chain linking Plaintiffs' alleged injuries to IFC and IFC AMC is dizzyingly remote. Plaintiffs allege that (1) IFC made a loan to Dinant in 2009; (2) IFC AMC made an investment in Banco Ficohsa, the largest bank in Honduras, in 2011; (3) Banco Ficohsa made loans to Dinant both before and after the investment by IFC AMC; and (4) IFC guaranteed loans that Ficohsa made to Dinant for intra-firm trades in 2013. D.I. 1 ¶¶ 10, 15–16. From this, Plaintiffs next allege that (1) Dinant used that money to hire private security forces and co-opt militia forces; and (2) those security forces committed tortious acts against Plaintiffs. D.I. 1 ¶ 453. These serious, tortious acts were in no respect "fairly traceable" to IFC AMC's investment in Banco Ficohsa. Rather, they were the result of independent action, including the alleged criminal activity of Dinant and the Honduran government. Plaintiffs' complaint accordingly fails to establish a sufficient causal connection and must be dismissed for lack of Article III standing.

B. Plaintiffs failed to establish third party standing for the unjust enrichment claim.

This Court's jurisdiction is prudentially limited by the doctrine of third-party standing, pursuant to which "a party 'generally must assert his own legal rights and interests, and cannot rest his claim to relief on the legal rights or interests of third parties.'" *Kowalski v. Tesmer*, 543 U.S. 125, 129 (2004) (quoting *Warth v. Seldin*, 422 U.S. 490, 499 (1975)). The only exception to this jurisdictional limitation is where "the party asserting the right has a 'close' relationship with the person who possesses the right" and "there is a 'hindrance' to the possessor's ability to protect his own interests." *Phila. Marine Trade Ass'n v. C.I.R.*, 523 F.3d 140, 145 (3d Cir. 2008) (citation omitted). For example, in *Philadelphia Marine*, the Third Circuit found that a trust fund administrator lacked third-party standing to bring suit on behalf of the fund where the fund was "not only willing to sue on its own behalf—it *ha[d]* sued," so there was no want of incentive for it to do so. *Id*.

Here, Plaintiffs allege that they are members of the farmer cooperatives, but they concede that the actual ownership of the land is held *by the cooperatives* in "collective profit." D.I. 1 ¶ 107. These cooperatives are governed by elected leadership and the cooperatives have challenged the land transfers on multiple occasions. D.I. 1 ¶¶ 107, 133–35. Like the trust fund in *Philadelphia Marine*, the cooperatives have repeatedly asserted their own interests in Honduran courts, and they therefore "d[o] not need a third party to protect [their] rights." *Phila. Marine*, 523 F.3d at 146. Plaintiffs' unjust enrichment claim must therefore be dismissed for lack of third party standing.

III. THIS COURT SHOULD DISMISS THE COMPLAINT FOR FAILURE TO JOIN INDISPENSABLE THIRD PARTIES

Under Rule 19, an absent party is necessary if without it (1) "complete relief" cannot be accorded among those already parties, or (2) the absent party "claims an interest relating to the

subject of the action and is so situated that disposing of the action in [that party's] absence may" either "(i) as a practical matter impair or impede [that] person's ability to protect the interest; or (ii) leave [the remaining] part[ies] subject to a substantial risk of incurring double, multiple, or otherwise inconsistent obligations because of the interest." Fed. R. Civ. P. 19(a). If the absent party is indispensable, the Court must determine whether "in equity and good conscience" the action should proceed without that party, or whether the action should be dismissed. *Steel Valley Auth. v. Union Switch & Signal Div.*, 809 F.2d 1006, 1013 (3d Cir. 1987).

A. At least five necessary parties are absent from this case.

In this case, Plaintiffs have failed to join five necessary parties:

- *Dinant's Security Forces*. The claimed injuries giving rise to Plaintiffs' causes of action were allegedly committed by Dinant and its security personnel. *See* D.I 1 ¶ 101, ¶ 102.
- *Dinant*. Plaintiffs claim that Dinant is responsible for the actions of its security personnel, including private and public security forces. D.I. 1 ¶ 431-41.
- *The Honduran Government*. Plaintiffs allege that government officials, including the Honduran military, committed many of these acts of violence. *E.g.*, D.I 1 ¶¶ 118, 176, 185, 186, 187, 432.
- *Banco Ficohsa*. Ficohsa provided direct financing to Dinant and is alleged to have had close relationships with Facussé. *E.g.*, ¶¶ 14, 205.

Each of the entities listed above "falls within the category of persons who, under [Rule 19(a)], should be 'joined if feasible.'" *Provident Tradesmens Bank & Tr. Co. v. Patterson*, 390 U.S. 102, 108 (1968). In this case, the absent parties' "presence is critical to the disposition of the important issues in the litigation" because they possess evidence or control witnesses whose presence would otherwise preclude a ruling on the merits. *Haas v. Jefferson Nat. Bank of Miami*

Beach, 442 F.2d 394, 398 (5th Cir. 1971). Without testimony from Dinant's security forces, the government militants, or the rural cooperatives who own the land and represent the farmers' interests, this Court cannot possibly resolve any of Plaintiffs' tort claims, including wrongful death, battery, and trespass. These entities and individuals are "key witness[es] whose testimony would be of inestimable value" in deciding these claims. *Id*.

Moreover, although not all joint tortfeasors are necessary parties under Rule 19, many of the parties listed above are necessary because they were all "active" or "primary" participants in the conduct wrongly attributed to IFC and IFC AMC. *Johnson & Johnson v. Coopervision, Inc.*, 720 F. Supp. 1116, 1128 (D. Del. 1989); *see also B. Fernandez & Hnos, Inc. v. Kellogg USA, Inc.*, 516 F.3d 18, 27 (1st Cir. 2008) ("Given that Kellogg Caribbean was a central player—perhaps even the primary actor—in the alleged breach, the practical course here . . . is to proceed in a forum where the absentee may be joined."); *Laker Airways, Inc. v. British Airways, PLC*, 182 F.3d 843, 848 (11th Cir. 1999) ("According to Laker's complaint, ACL would certainly be considered an active participant in the allegations . . . We determine, therefore, that ACL is a necessary party and should be joined, if feasible."); *Freeman v. Nw. Acceptance Corp.*, 754 F.2d 553, 559 (5th Cir. 1985) ("First Commercial is clearly a person 'to be joined if feasible' under Rule 19(a) . . . . First Commercial was more than an active participant in the conversion alleged by the Freemans'; it was the primary participant.").

The above-mentioned parties are necessary for a variety of other reasons as well. To begin, were the Court to proceed with these claims, it would greatly impair the absent parties' ability to protect their interests including, in the case of the Honduran government, its immunities. *See* Fed. R. Civ. P. 19(a)(2). Of particular concern here is that all of the liability determinations would hinge on the culpability and negligence of absent parties. Moreover, one set of allegations central

to Plaintiffs' claims is that Dinant and Banco Ficohsa violated the terms of their loan agreements, yet neither of those parties is before this court to defend their actions under the agreements. Put simply, "because the court would have to review the [absent parties'] actions in order to fashion a remedy, [they are] necessary and indispensable part[ies]." *Acierno v. Preit-Rubin, Inc.*, 199 F.R.D. 157, 163 (D. Del. 2001).

In their absence, "complete relief" cannot be accorded because if the Court found IFC AMC to be liable, it would have claims against the absent parties. Moreover, the relief Plaintiffs seek, including injunctive relief, cannot ever be "complete" without a judgment against Dinant or the Honduran Government, because IFC AMC has no relationship whatsoever with, or control over, Dinant or the Honduran Government. *See* Fed. R. Civ. P. 19(a)(1). Courts have required joinder in cases, like this one, where the plaintiffs' requested injunction would not bind an absent party. *See, e.g.*, *Acierno*, 199 F.R.D. at 163 (finding government entity—a county—to be a necessary party where an injunction would have the effect of overruling prior action taken by the county); *Dawavendewa v. Salt Water Project Agric. Improvement*, 276 F.3d 1150, 1155-56 (9th Cir. 2002) (concluding the Navajo nation was a necessary party where it would not be bound by the injunction plaintiff sought).

B. This court lacks jurisdiction to join the absent parties to this case.

Per the allegations in the complaint, the five absent parties are not subject to the jurisdiction of this Court. To begin, the Government of Honduras is immune from suit and cannot be subjected to this Court's jurisdiction absent its own waiver of immunity or another exception set forth in the FSIA. *Argentine Republic v. Amerada Hess Shipping Corp.*, 488 U.S. 428, 439 (1989) ("[T]he FSIA provides the sole basis for obtaining jurisdiction over a foreign state in federal court."). Under established precedent, where a foreign sovereign is a required party for the purposes of Rule

19, and such party is not subject to any exception to the immunities under the FSIA, the case must be dismissed. *Republic of Philippines v. Pimentel*, 553 U.S. 851, 867 (2008) ("A case may not proceed when a required-entity sovereign is not amenable to suit."); *TJGEM LLC v. Republic of Ghana*, 26 F. Supp. 3d 1, 7 (D.C. Cir. 2013) (same).

Moreover, Dinant, its security forces, Banco Ficohsa, and the rural cooperatives are Honduran entities entirely lacking contacts with the United States or Delaware and thus had no reason to anticipate being haled into this Court. *D'Jamoos ex rel. Estate of Weingeroff v. Pilatus Aircraft Ltd.*, 566 F.3d 94, 105 (3d Cir. 2009) (exercise of personal jurisdiction requires "that the defendant's conduct and connection with the forum State are such that he should reasonably anticipate being haled into court there"); *Wilson v. Canada Life Assurance Co.*, No. 4:08-CV-1258, 2009 WL 532830, at *2 (M.D. Pa. Mar. 3, 2009) ("Joinder may not be feasible for a number of reasons, including because joinder would destroy diversity, or, as alleged in this case, because the court lacks personal jurisdiction over the absentee.") (citation omitted).

C. Dismissal is warranted.

If an absent party is necessary but cannot be joined for lack of jurisdiction, the Court must determine whether it can proceed without the indispensable party "in equity and good conscience." *Gen. Refractories Co. v. First State Ins. Co.*, 500 F.3d 306, 319 (3d Cir. 2007). Rule 19(b) dictates that courts should consider several factors in deciding whether to dismiss an action:

> (1) [T]he extent to which a judgment rendered in the person's absence might prejudice that person or the existing parties; (2) the extent to which prejudice could be lessened or avoided by: (A) protective provisions in the judgment; (B) shaping the relief; or (C) other measures; (3) whether a judgment rendered in the person's absence would be adequate; and (4) whether the plaintiff would have an adequate remedy if the action were dismissed for nonjoinder.

Fed. R. Civ. P. 19(b). Here, each of these factors indicates this action cannot proceed without the absent parties.

First, a judgment rendered in absence of the parties would cause significant prejudice to their interests. This includes the significant immunity interests of the Government of Honduras under the FSIA. *See Pimentel*, 553 U.S. 851 at 866–67 (courts must consider comity and dignity interests of foreign sovereigns and may not simply "bypass [another nation's] courts without right or good cause"). It would be a "specific affront" to the Government of Honduras for a U.S. court to issue judgment on disputed property claims in a foreign land. *Id*. at 866. Where, as here, the interests of the immune party is "not frivolous, dismissal of the action must be ordered where there is a potential for injury" to their interests. *Id*. at 867. Prejudice would likewise result to the interests of Dinant, the Farmer Cooperatives, and Banco Ficohsa, as discussed above. *See Provident Tradesmens Bank*, 390 U.S. at 110 (noting the effects that a judgment can have on nonparties, even without res judicata). And IFC AMC has a significant interest in "avoid[ing] multiple litigation, or inconsistent relief, or sole responsibility for a liability" that it may share with the absent parties. *Id*.

Second, this prejudice cannot be avoided by shaping the relief. Each of Plaintiffs' claims implicate the interests of government actors, who are immune from suit. *See* D.I. 1 ¶ 432 (explaining that Plaintiffs' tort claims are premised on the conduct of "Honduran military and police forces acting under a Memorandum of Understanding or other agreement or arrangement with Dinant"). And the prejudice to IFC AMC would be so significant if it were required to proceed in isolation that any fashioned relief would be inadequate.

Third, a judgment in the absence of these parties would be wholly inadequate. Central to Plaintiffs' complaint is the request for injunctive relief, but as discussed above that relief would be of no import in the absence of the Government of Honduras, which is immune from suit. Moreover, considerations of consistency and efficiency indicate that these actions should be

dismissed and brought instead in a foreign court, likely in the courts of Honduras. Because the non-joined parties were active participants in the conduct at the center of Plaintiffs' claims, a trial in their absence—in a jurisdiction with little or no connection to the parties, events, and evidence at issue—would unnecessarily burden this Court and prolong the litigation.

Fourth, Plaintiffs would have an adequate remedy were the case dismissed for nonjoinder. By bringing the case in Honduras, Plaintiffs could join other parties with substantial assets, including Dinant and Banco Ficohsa, who are not subject to personal jurisdiction in the United States. Honduras is also a superior forum for practical reasons—effectively all of the material witnesses to the alleged conduct giving rise to Plaintiffs' claims, and the documents bearing on causation, liability, and alleged damages, are all located solely in Honduras.

IV. PLAINTIFFS HAVE FAILED TO STATE ANY PLAUSIBLE CLAIM FOR RELIEF

Despite its length, Plaintiffs' complaint fails to state any "plausible scenario" in which Plaintiffs are entitled to relief from IFC AMC under either Delaware or Honduran law and dismissal is warranted under Rule 12(b)(6). *Bell Atl. Corp. v. Twombly*, 550 U.S. 544, 555–57 (2007).[3] In evaluating a Rule 12(b)(6) motion to dismiss, this Court accepts as true the well-pleaded allegations in the complaint. *Resnik v. Woertz*, 774 F. Supp. 2d 614, 629 (D. Del. 2011) (standard for Rule 12(b)(6) review). If the well-pleaded allegations do not state a plausible claim for relief, the complaint must be dismissed. *Id.*

First, the bulk of Plaintiffs' claims relate to the intentional tortious conduct of third parties, namely Dinant and public and private security personnel. D.I. 1 ¶¶ 530–75, 596–602 (wrongful

[3] Because Plaintiffs have failed to state a claim under either Delaware or Honduran law, a choice of law analysis to determine which substantive law governs is unnecessary.

death, battery, assault, intentional infliction of emotional distress, false imprisonment, and trespass). These claims fail because Plaintiffs have not alleged facts sufficient to render IFC AMC liable for the tortious conduct of third parties. Second, Plaintiffs bring claims related to IFC AMC's own allegedly negligent acts. *Id.* ¶¶ 576–95 (negligent infliction of emotional distress, negligence). These claims fail because Plaintiffs have not alleged a duty that IFC AMC owed Plaintiffs, nor have they alleged that IFC AMC's acts were the proximate cause of their injuries. Finally, Plaintiffs' remaining claim for unjust enrichment fails because Plaintiffs have not alleged a direct relationship between the deprivation of their property and IFC AMC's enrichment. *Id.* ¶¶ 603–10.

A. Plaintiffs have failed to state a claim for aiding and abetting liability.

Many of Plaintiffs' tort claims do not, on their face, have anything to do with the conduct of IFC AMC. Rather, Plaintiffs allege a number of torts committed by Dinant and Dinant's security personnel. D.I. 1 ¶¶ 530–75, 596–602 (wrongful death, battery, assault, intentional infliction of emotional distress, false imprisonment, and trespass). Even though these torts were committed by third parties thousands of miles away, Plaintiffs nonetheless claim that IFC AMC is liable because it aided and abetted this tortious conduct by providing financing to Dinant through Banco Ficohsa. D.I. 1 ¶¶ 442–49. IFC AMC's conduct with respect to Dinant is plainly insufficient to invoke aiding and abetting liability and each of these claims should be dismissed.

Under an aiding and abetting theory of liability under Delaware law, IFC AMC would be liable "[f]or harm resulting to a third party from the tortious conduct of another" if IFC AMC (1) "knows that the other's conduct constitutes a breach of duty," and (2) "gives substantial assistance or encouragement to the other so to conduct himself." *In re Dole Food Co., Inc. Stockholder Litig.*, No. CV 8703-VCL, 2015 WL 5052214, at *41 (Del. Ch. Aug. 27, 2015) (quoting *Restatement*

(Second) of Torts § 876(b) (1979)); *see also Anderson v. Airco, Inc.*, No. CIV.A. 02C-12-091HDR, 2004 WL 2827887, at *4 (Del. Super. Ct. Nov. 30, 2004) (noting that the concept of civil liability for providing substantial assistance is "a more recent phenomenon in the civil, non-fiduciary arena"). Plaintiffs' aiding and abetting theory fails because Plaintiffs have not alleged either the knowledge or substantial assistance required to invoke aiding and abetting liability.

First, Plaintiffs' allegation that IFC and IFC AMC were generally aware of Dinant's tortious conduct is insufficient to fulfill the knowledge element. D.I. 1 ¶ 443. Under Delaware law for aiding and abetting liability, "mere knowledge is insufficient" and the "knowledge element must be coupled with some degree of intent." *Jenkins v. Williams*, No. CIV.A.02-331-GMS, 2008 WL 1987268, at *14 (D. Del. May 7, 2008).

Accordingly, Plaintiffs must allege facts supporting the inference that IFC and IFC AMC acted with some degree of intent in assisting Dinant, i.e., the organizations intended to assist or encourage Dinant in the commission of these intentional torts. *See Taylor v. Am. Chemistry Council*, 576 F.3d 16, 35 (1st Cir. 2009) (holding for aiding and abetting liability defendant must possess "unlawful intent," which includes "knowledge that the other's conduct is tortious" and "an intent to substantially assist or encourage that conduct"); *Goldberg v. UBS AG*, 660 F. Supp. 2d 410, 425 (E.D.N.Y. 2009) (aiding and abetting requires "knowledge of the illegal activity that is being aided and abetted, a desire to help that activity succeed, and some act to further such activity to make it succeed"); *Juhl v. Airington*, 936 S.W.2d 640, 644 (Tex. 1996) (defendant must possess "unlawful intent, i.e., knowledge that the other party is breaching a duty and the intent to assist that party's actions") (quoting *Payton v. Abbott Labs,* 512 F. Supp. 1031, 1035 (D. Mass. 1981)).

In this case, Plaintiffs have failed to allege any facts suggesting that IFC or IFC AMC intended to assist Dinant in this fashion. At most, Plaintiffs allege that IFC and IFC AMC loaned

money to Dinant (directly or indirectly through Banco Ficohsa) and thus intended to assist Dinant in the financing of its general business operations. That is insufficient to render IFC or IFC AMC liable for every intentional tort committed by an agent of Dinant. Indeed, if these allegations as pled were sufficient to state a claim, Plaintiffs would have an equally plausible aiding and abetting claim against every lender, supplier, or counterparty that has ever facilitated Dinant's operations with the awareness that Dinant was allegedly involved in a violent land conflict with farmer cooperatives in the Bajo Aguán.

Second, Plaintiffs have also failed to allege that IFC or IFC AMC substantially assisted Dinant in the commission of the underlying intentional torts. The assistance the defendant provided must be a "substantial factor in causing the resulting tort." *Taylor*, 576 F.3d at 35 (quoting *Restatement (Second) of Torts* § 876 cmt. D); *see also Aetna Cas. & Sur. Co. v. Leahey Constr. Co.*, 219 F.3d 519, 537 (6th Cir. 2000) (plaintiff must show that "the secondary party proximately caused the violation, or, in other words, that the encouragement or assistance was a substantial factor in causing the tort") (quoting *K & S P'ship v. Continental Bank, N.A.*, 952 F.2d 971, 979 (8th Cir. 1991)).

Here, the allegations do not plausibly support a finding of substantial assistance. Again, Plaintiffs allege that IFC and IFC AMC facilitated, either directly or through Banco Ficohsa, financing for Dinant's general operations. Plaintiffs allege that this financing provided "Dinant with the capital and reputational cover to violently suppress farmers' opposition." D.I. 1 ¶ 448. But this conclusory allegation does nothing to explain how IFC and IFC AMC's assistance was a "substantial factor" in causing Plaintiffs' injuries. *See El Camino Res., LTD. v. Huntington Nat'l Bank*, 722 F. Supp. 2d 875, 910–11 (W.D. Mich. 2010), *aff'd,* 712 F.3d 917 (6th Cir. 2013) ("[S]ubstantial assistance means something more than merely providing routine professional

services that aid the tortfeasor in remaining in business, but do not proximately cause the plaintiffs' harm . . . ."). In this respect, Plaintiffs have failed to draw any straight lines running between their injuries and the actions of IFC and IFC AMC. There is no suggestion, for example, that the loans to Dinant were made with the explicit or implicit purpose of funding an expansion of Dinant's security operations. Similarly, there is no allegation that the loans were particularly critical to Dinant's overall financial health or that Dinant would have trouble funding its operations absent IFC and IFC AMC's intervention.

Accordingly, Plaintiffs have failed to plausibly allege that the intermittent loans from IFC or Banco Ficohsa satisfy the knowledge and substantial assistance elements for aiding and abetting liability. The allegations are likewise insufficient under Honduran law, which sets a higher bar by requiring that the defendant "force or directly induce[] someone to commit a crime" or "cooperate[] with the commission of a crime." Turcios Decl. ¶¶ 56-57.

B. Plaintiffs' claims related to IFC and IFC AMC's alleged negligence fail to sufficiently allege duty or causation.

"Under Delaware law, to prevail on a claim of negligence, a plaintiff must prove (1) that the defendant owed the plaintiff a duty of care, (2) that the defendant breached that duty, (3) and that the plaintiff's injury was proximately caused by the breach of that duty." *Halchuck v. Williams*, 635 F. Supp. 2d 344, 346 (D. Del. 2009). With respect to Plaintiffs' claims for negligence and negligent infliction of emotional distress, D.I. 1 ¶¶ 576–95, Plaintiffs failed to sufficiently plead either a recognized duty or that IFC and IFC AMC proximately caused their injuries, and dismissal of their negligence claims is therefore warranted. This conclusion also holds true under Honduran law. Turcios Decl. ¶ 81.

First, Plaintiffs have failed to allege any recognized duty of care. "[W]hether a duty exists is entirely a question of law, to be determined by reference to the body of statutes, rules, principles

and precedents which make up the law; and it must be determined by the court." *Pipher v. Parsell*, 930 A.2d 890, 892 (Del. 2007) (citation omitted). "If no duty exists, 'a trial court is authorized to grant judgment as a matter of law.'" *Id*.

Plaintiffs allege that IFC and IFC AMC loaned money to Dinant and that Dinant is responsible for the various injuries alleged in the complaint. But under Delaware law, "[t]here is no duty to control the conduct of a third person as to prevent him from causing physical harm to another unless" a recognized "special relationship" exists between the alleged tortfeasor and the plaintiff. *Rogers v. Christina Sch. Dist.*, 73 A.3d 1, 11 (Del. 2013). This principle is especially true in the context of a lender-borrower relationship, where it is widely recognized that lenders "do not owe non-customers a duty to protect them from the intentional torts of their customers." *Lerner v. Fleet Bank, N.A.*, 459 F.3d 273, 286 (2d Cir. 2006). It is thus the "universal rule in this country" that a "bank's relationship is with its customer and that the bank owes third parties no duty of care to monitor a customer's activities." *El Camino Res., LTD.*, 722 F. Supp. 2d at 907.

In search of a duty that is at odds with our legal tradition, Plaintiffs allege that IFC and IFC AMC "assume legal obligations to the communities affected by their projects" in light of their internal policies. D.I. ¶ 390. But even though IFC and IFC AMC may indeed be internally "*mission*-bound to help" the communities it serves, D.I 1 ¶ 382 (emphasis added), but it is not *duty*-bound to do so. Stated otherwise, "[t]he injured party must show that a defendant owed not merely a general duty to society but a specific duty to him or her, for without a duty running directly to the injured person there can be no liability in damages, however careless the conduct or foreseeable the harm." *Hamilton v. Beretta U.S.A. Corp.*, 750 N.E.2d 1055 (N.Y.), *opinion after certified question answered*, 264 F.3d 21 (2d Cir. 2001) (citation omitted).

Accordingly, IFC and IFC AMC did not owe Plaintiffs a duty to protect them from the intentional torts of Dinant. The loans and investments involving Dinant and Ficohsa did not put IFC or IFC AMC in a "relation of dependence or of mutual dependence" with Plaintiffs so as to "trigger a duty to act for their protection." *Doe 30's Mother v. Bradley*, 58 A.3d 429, 451 (Del. Super. Ct. 2012).

***Second*,** Plaintiffs further fail to sufficiently allege proximate causation to survive a motion to dismiss. *See Halchuck v. Williams*, 635 F. Supp. 2d 344, 347 (D. Del. 2009) (recognizing that proximate cause can be decided as a matter of law). Under Delaware law, proximate cause is causation "which in [a] natural and continuous sequence, unbroken by any efficient intervening cause, produces the injury and without which the result would not have occurred." *Duphily v. Del. Elec. Coop., Inc.*, 662 A.2d 821, 829 (Del. 1995) (emphasis omitted). Here, as described throughout this motion and as made clear in the complaint, IFC and IFC AMC's involvement was far too remote to be considered part of an "unbroken" chain leading to the events described in Plaintiffs' complaint. At bottom, under "[a]ny way the court looks at it," IFC AMC's alleged negligence is not the proximate cause of Plaintiffs' alleged injuries. *Vollendorf v. Craig*, No. Civ.A.01C08106FSS, 2004 WL 440418, at *3 (Del. Super. Ct. Mar. 9, 2004).

C. IFC and IFC AMC are not liable for unjust enrichment.

Under Delaware law, the elements of unjust enrichment are (1) an enrichment, (2) an impoverishment, (3) a relation between the enrichment and impoverishment, (4) the absence of justification, and (5) the absence of a remedy provided by law. *Bakerman v. Sidney Frank Importing Co.*, No. 1844, 2006 WL 3927242, at *18 (Del. Ch. Oct. 10, 2006). Plaintiffs allege that IFC AMC has been unjustly enriched because Dinant obtained farmland in the 1990s through fraud or coercion, Dinant used that farmland decades later to generate revenue to repay loans made

by Banco Ficohsa, and Banco Ficohsa used those funds to repay loans made by IFC AMC. D.I. 1 ¶¶ 113-14, 604-10.

Plaintiffs' allegations are insufficient to plausibly make out the third element of unjust enrichment—a relation between the enrichment and the impoverishment. To prove a relation between enrichment and impoverishment, a plaintiff must show "some *direct* relationship" between the two. *Vichi v. Koninklijke Philips Elecs. N.V.*, 62 A.3d 26, 59–60 (Del. Ch. 2012). "In other words, there must be '[a] showing that the defendant was enriched unjustly by the plaintiff who acted for the defendant's benefit.'" *Id.*; *see also MetCap Sec. LLC v. Pearl Senior Care, Inc.*, No. Civ. A. 2129-VCN, 2007 WL 1498989, at *6 (Del. Ch. May 16, 2007) ("[I]t is axiomatic that there must be some relationship between the parties. A showing that the defendant was enriched unjustly by the plaintiff who acted *for* the defendant's benefit is essential.").

Here, Plaintiffs allegations support at most the inference that Dinant was unjustly enriched by the land transfers. Plaintiffs cannot use that unjust enrichment as a basis for recouping any and all funds that Dinant used to repay unrelated loans made by IFC AMC to Banco Ficohsa under specific, contractual terms. *Vichi*, 62 A.3d at 59–60. If Plaintiffs' theory of liability were correct, Plaintiffs would have an unlimited claim to every dollar Dinant has spent since the land transfers and would be able to bring an unjust enrichment claim against every party that has ever done business (or will ever do business) with Dinant. Moreover, Plaintiffs have likewise failed to state a claim for unjust enrichment under Honduran law. Such a claim requires an underlying criminal conviction, Declaration, Turcios Decl. ¶ 55, which has not been alleged. Accordingly, the unjust enrichment claim should be dismissed for failure to state a claim.

V. PLAINTIFFS' CLAIMS ARE BARRED BY THE STATUTE OF LIMITATIONS

For Plaintiffs' tort claims,[4] the statute of limitations under Delaware law is two years or, in the case of the claim for trespass, three years. *See* Del. Code Ann. tit. 10, § 8119; *Id.* § 8106.[5] The limitations period for these tort claims begins to run at the time of injury. *Rose Hall, Ltd. v. Chase Manhattan Overseas Banking Corp.*, 494 F. Supp. 1139, 1157 (D. Del. 1980). While Plaintiffs failed to specify the dates of each of their alleged injuries, the complaint suggests that most of the violence took place between 2009 and 2014. *E.g.*, D.I. 1, ¶¶ 203, 232, 268, 345. Plaintiffs filed the instant complaint on October 24, 2017. D.I. 1. To the extent Plaintiffs were injured before October 24, 2015 or, in the case of the trespass claim, October 24, 2014, their claims are untimely.[6]

For Plaintiffs' sole remaining claim for unjust enrichment, the applicable statute of limitations is three years and the limitations period begins to run "when the wrongful act causing the enrichment and impoverishment occurred." *Pulieri v. Boardwalk Props., LLC*, No. 9886-CB, 2015 WL 691449, at *13 (Del. Ch. Feb. 18, 2015). This claim is brought by one individual plaintiff on behalf of a class of residents who held land that was subsequently sold to Dinant. D.I. 1 ¶¶ 490–91. According to the complaint itself, the questionable land transfers took place in the 1990s and farmer cooperatives filed several lawsuits around 1998 seeking to challenge the land transfers.

[4] This includes the claims for (1) wrongful death, (2) battery, (3) assault, (4) intentional infliction of emotion distress, (5) false imprisonment, (6) negligent infliction of emotional distress, (7) negligence, and (8) trespass.

[5] The Honduran statute of limitations does not apply to any of Plaintiffs' claims because, pursuant to Delaware's borrowing statute, Delaware's is the shorter of the two statutes. *See* Del. Code Ann. tit. 10, § 8121; Turcios Decl. ¶¶ 70–79.

[6] The prior complaint that Plaintiffs voluntarily dismissed does not toll the statute of limitations and the Delaware complaint does not "relate back" to the prior complaint. *See In re Direxion Shares ETF Tr.*, 279 F.R.D. 221, 236 (S.D.N.Y. 2012); *In re IndyMac Mortg.-Backed Sec. Litig.*, 718 F. Supp. 2d 495, 504 (S.D.N.Y. 2010).

Id. ¶¶ 110–17, 133. Accordingly, the unjust enrichment claim is plainly barred by the statute of limitations, which requires that the "wrongful act" have occurred on or after October 24, 2014.

To the extent Plaintiffs allege that tolling will rescue their untimely claims, such tolling is unavailable. D.I. 1 ¶¶ 611–22. Under Delaware law, the limitations period is tolled "*only until* the plaintiff discovers (or exercising reasonable diligence should have discovered) his injury." *EBS Litig. LLC v. Barclays Glob. Inv'rs, N.A.*, 304 F.3d 302, 305 (3d Cir. 2002) (quoting *In re Dean Witter P'ship Litig.*, 1998 WL 442456, at *6 (Del. Ch. July 17, 1998), *aff'd,* 725 A.2d 441 (Del. 1999)). Plaintiffs failed to make *any* allegations suggesting that they were delayed in discovering their injuries. Indeed, it is difficult to imagine how Plaintiffs could have been delayed when the injuries they alleged—for instance, assaults, kidnappings, and harassment—would have been immediately apparent to the victims.

VI. THE COURT SHOULD DISMISS THE COMPLAINT UNDER THE DOCTRINE OF *FORUM NON CONVENIENS*

Under the doctrine of *forum non conveniens*, a district court may dismiss the suit if a defendant identifies an available, adequate forum that, upon weighing the applicable interests, is the preferred location for the suit. *See Eurofins Pharma US Holdings v. BioAlliance Pharma SA*, 623 F.3d 147, 160 (3d Cir. 2010). The plaintiffs in this case are all non-U.S. residents, and all of their claims arise entirely from conduct by non-U.S. entities that occurred outside of the United States. Because Honduran courts regularly hear these claims, and the relevant interests heavily favor Honduras as an alternative forum, this case should be dismissed.[7]

[7] For many of the same reasons, IFC AMC has explained why this Court can also transfer this case to the District of Columbia for further proceedings. *See* D.I. 23 (motion to transfer).

A. The Honduran courts provide an adequate, alternate forum.

"[W]hen considering a motion to dismiss on *forum non conveniens* grounds, a district court must first determine whether an adequate alternate forum can entertain the case." *Eurofins Pharma US Holdings*, 623 F.3d at 160 (alteration in original). This analysis encompasses considerations of availability (whether relief is available in the alternative forum), and adequacy (whether something more than "clearly . . . unsatisfactory" relief may be obtained). *See Piper Aircraft Co. v. Reyno*, 454 U.S. 235, 254 (1981). Both of these considerations warrant dismissal of this case.

To begin, Honduran courts are an *available* forum in this case. The availability of an alternative forum turns on whether—in that alternative forum—"defendants are amenable to process and plaintiffs' claims are cognizable." *Kisano Trade & Invest Ltd. v. Lemster*, 737 F.3d 869, 873 (3d Cir. 2013). All of Plaintiffs' claims are cognizable in Honduras, *see* Ex. B, Turcious Decl. ¶¶ 55-59 (discussing process for plaintiffs to obtain relief in Honduras), so the only question that remains is whether the parties are "amenable to process." *Lemster*, 737 F.3d at 873. The typical *forum non conveniens* analysis "presupposes at least two forums in which the defendant is amenable to process" and "the doctrine furnishes criteria for choice between them." *Gulf Oil Corp. v. Gilbert*, 330 U.S. 501, 507 (1947). There is nothing "typical," however, about this case, given IFC AMC's immunity from suit in both forums, and Plaintiffs' decision to omit necessary parties who are unquestionably subject to the jurisdiction of the courts in Honduras. *See supra* (IFC AMC immune from suit; discussion on necessary parties). In such cases, the court need not "presuppose" jurisdiction in either forum and may instead "presume, rather than dispositively decide, the propriety of the forum." *See Sinochem*, 549 U.S. at 434 (presuming jurisdiction existed in "the forum in which the plaintiff filed suit"); *Castillo v. Shipping Corp. of India*, 606 F. Supp. 497, 503 (S.D.N.Y. 1985) (presuming jurisdiction existed over sovereign entity in the alternative forum,

and instead stressing applicability of other factors, including that "not one act connected with this lawsuit occurred [in the United States]").

The reason for this rule is simple: plaintiffs cannot "craftily preemptively defeat" a *forum non conveniens* motion by joining an improper set of parties to a lawsuit. *See PT United Can Co. v. Crown Cork & Seal Co.*, 138 F.3d 65, 74 (2d Cir. 1998). In *PT United*, plaintiffs tried to argue that the court was required to consider the availability of the alternative forum "as to all defendants"—both those dismissed for lack of personal jurisdiction, and those still party to the lawsuit. *Id*. The court flatly rejected the argument, noting the absurd result with such a position:

> [A] Swedish plaintiff could bring an action in the Southern District of New York against a Swedish defendant and a California citizen with a known jurisdictional defect and no links to Sweden. If the court had to consider the adequacy of Sweden as an alternate forum as to all defendants, dismissed and non-dismissed, the Swedish plaintiff would likely, and absurdly, prevail, and a case between two Swedish parties would unnecessarily proceed in U.S. court.

Id. Here, an inverse situation is at play—by naming only immune parties to a lawsuit and omitting necessary parties who are subject to the jurisdiction of the alternative forum, a foreign plaintiff could ostensibly proceed in a U.S. court and "preemptively defeat" a *forum non conveniens* motion brought by an immune U.S. defendant. *Id*. This is precisely the kind of "justice blended with some harassment" that the *forum non conveniens* doctrine seeks to avoid. *See Gulf Oil Corp.*, 330 U.S. at 507 (1947). In such cases, like this one, a court may "presume" the propriety of the forum and then consider the other interests at stake. *See Sinochem*, 549 U.S. at 434. Stated otherwise, the lack of jurisdiction in the alternative forum is not dispositive—"in some instances, . . . plaintiffs will be left without a forum for definitive resolution of their claims. But that result is contemplated under the doctrine of [international organizations] immunity." *Cf.*

Pimentel, 553 U.S.at 872 (discussing an analogous situation involving foreign sovereign immunity).[8]

Honduran courts are also an *adequate* forum to hear Plaintiffs' claims, as recovery is available, and Honduran courts are capable of handling complex tort claims. As a threshold matter, it is "[u]ndeniably" the case that "the defendant faces a rather low bar for establishing that the alternative forum is adequate." 14 Charles Alan Wright & Arthur R. Miller, Federal Practice & Procedure § 3828.3 (4th ed. 2017). Even claims of harassment by government officials are insufficient—defendants need only negate the charge "that the courts of [the alternative forum] are gravely inconvenient or unfair." *Zeevi Holdings Ltd. v. Republic of Bulgaria*, 494 F. App'x 110, 114 (2d Cir. 2012) (emphasis omitted). As demonstrated below, IFC AMC has met the "low bar" here, as the relief available to Plaintiffs in Honduras is more than adequate.

To begin, Honduran law provides relief on each of Plaintiffs' claims. *See* Turcios Decl. ¶¶ 55–59 (discussing execution procedure in Honduras). The relief is admittedly different in *form*, but courts may not give weight to procedural or substantive advantages presented by the U.S. court system, or the fact that "U.S. law provides a more favorable liability standard." *Trotter v. 7R Holdings LLC*, 873 F.3d 435, 443 (3d Cir. 2017); *see also Reyno*, 454 U.S. at 247 ("The possibility of a change in substantive law should ordinarily not be given conclusive or even substantial weight in the *forum non conveniens* inquiry."). And a number of federal courts have agreed, finding Honduras to be an adequate forum. *See, e.g.*, *Stalinski v. Bakoczy*, 41 F. Supp. 2d 755, 759 (S.D. Ohio 1998) (finding Honduras to be an adequate forum where affidavit established that "Honduran

[8] Moreover, a party need not stipulate to jurisdiction, as it is the law of the forum that renders a party amenable to jurisdiction, not the consent of the party. *See Kamel v. Hill-Rom Co.*, 108 F.3d 799, 803 (7th Cir. 1997) (finding that "even without [defendant's] consent, Saudi law would render [defendant] amenable to Saudi jurisdiction").

law provides analogous causes of action and adequate remedies for Plaintiff's alleged claims"); *Rodriguez v. Shell Oil Co.*, 950 F. Supp. 187, 188 (S.D. Tex. 1996) (same); *Delgado v. Shell Oil Co.*, 890 F. Supp. 1324, 1361 (S.D. Tex. 1995), *aff'd*, 231 F.3d 165 (5th Cir. 2000) (finding that "plaintiffs will not be deprived of all remedies in the courts of Honduras and that plaintiffs would not be treated unfairly by the courts of Honduras."). Indeed, Plaintiffs have admittedly availed themselves of the Honduran court system on these issues in the past. D.I 1 ¶¶ 133–35.

Next, the Honduran judicial system routinely handles tort claims, is an independent body, and affords due process to all plaintiffs. *See* Turcios Decl. ¶¶ 26-37. This is sufficient to render Honduras an adequate forum. Generalized grievances of corruption do not cut against this. *See, e.g.*, *Stalinski*, 41 F. Supp. 2d at 760 ("[T]he 'alternative forum is too corrupt to be adequate' argument does not enjoy a particularly impressive track record.") (citation omitted); *BFI Grp. Divino Corp. v. JSC Russian Aluminum*, 298 Fed. Appx. 87, 91 (2d Cir. 2008) ("Where a plaintiff rebuts the defendant's claim of adequacy of the forum with charges that the foreign judicial process is biased or corrupt, this Court and our district courts are reluctant to agree."); *El–Fadl v. Central Bank of Jordan,* 75 F.3d 668, 678 (D.C. Cir. 1996), *abrogated by Samantar v. Yousuf*, 560 U.S. 305 (2010) ("A foreign forum is not inadequate merely because . . . of general allegations of corruption in the judicial system.") (citations omitted). To the contrary, courts consider it highly paternalistic to pass judgment on another country's judicial system out of a perceived superiority. *See, e.g.*, *Rodriguez*, 950 F. Supp. at 188 (rejecting contention that "due to a lack of experience and resources and different procedures, Honduran courts are not as efficient as American courts in adjudicating mass tort litigation involving American defendants"); *Base Metal Trading Ltd. v. Russian Aluminum*, 98 F. App'x 47, 50 (2d Cir. 2004) ("[I]t is not the business of our courts to

assume responsibility for supervising the integrity of the judicial system of another sovereign nation.") (citations omitted).

B. Plaintiffs' choice of forum is not entitled to deference, and the balance of factors highly favors Honduras as an alternative forum.

"After finding that an adequate alternative forum exists, the district court must 'determine[] the amount of deference due to the plaintiff's choice of forum' and 'balance the relevant private and public interest factors.'" *Trotter*, 873 F.3d at 442 (quoting *Eurofins Pharma US Holdings*, 623 F.3d at 160). "If the balance of these factors indicates that trial in the chosen forum would result in oppression or vexation to the defendant out of all proportion to the plaintiff's convenience, the district court may, in its discretion, dismiss the case on *forum non conveniens* grounds." *Eurofins Pharma US Holdings*, 623 F.3d at 160 (citation omitted).

To begin, and as noted above, the plaintiffs in this case are all non-U.S. residents, and all of their claims arise entirely from alleged conduct by non-U.S. entities that occurred outside of the United States. Under these circumstances, Plaintiffs' choice of the United States as the forum is not entitled to deference. *See Reyno*, 454 U.S. at 255–56 ("When the home forum has been chosen, it is reasonable to assume that this choice is convenient. When the plaintiff is foreign, however, this assumption is much less reasonable."); *In re Link_A_Media Devices Corp.*, 662 F.3d 1221, 1223 (Fed. Cir. 2011) (per curiam) ("To be sure, the Third Circuit places significance on a plaintiff's choice of forum. When a plaintiff brings its charges in a venue that is not its home forum, however, that choice of forum is entitled to less deference."); *Linex Techs., Inc. v. Hewlett-Packard Co.*, No. 11-400-GMS, 2013 WL 105323, at *3 (D. Del. Jan. 7, 2013) ("[W]hen a plaintiff chooses to bring an action in a district where it is not physically located, its forum preference is entitled to something less than the paramount consideration . . . ."). The choice of Delaware in particular is

not entitled to deference, as plaintiffs initially filed this lawsuit in Washington, D.C. before voluntarily dismissing the case and re-filing in this court.

C. The private interest factors weigh strongly in favor of dismissal.

The second step in the *forum non conveniens* analysis is to weigh the private interest factors. *See Gulf Oil Corp.*, 330 U.S. at 508. The private interest factors include: access to sources of proof; availability of compulsory process for attendance of unwilling witnesses; the cost of obtaining attendance of willing witnesses; possibility of view of premises, if view would be appropriate to the action; and all other practical problems that make trial of a case easy, expeditious and inexpensive. *Trotter*, 873 F.3d at 442 (quoting *Gulf Oil Corp.*, 330 U.S. at 508). As explained below, these private interest factors weigh heavily in favor of dismissal.

First, significant evidence in this case is located in Honduras, including material witnesses and documents bearing on causation, liability, and alleged damages. *See* D.I 1 ¶ 93 ("Honduran farmers in the Bajo Aguán – including the Plaintiffs and their families – have farmed small parcels of land in the Aguán valley of Honduras"); ¶ 114 ("Miguel Facussé and his agents used unjust, illegal and tortious means to acquire dozens of farms owned by farmer cooperatives in the Aguán, which he consolidated into large palm plantations"); ¶ 156 ("IFC staff conducted a visit to Dinant sites in Honduras from August 12-16, 2008"); ¶ 455 ("The Plaintiffs have been the victims of violent incidents perpetrated by Dinant's security personnel in the Bajo Aguán from 2010 until the present"); ¶¶ 456–71 (noting that all of the plaintiffs reside in the Bajo Aguán, and that the alleged murders, assaults, dispossessions of land, and other acts, all took place in the Bajo Aguán). To effectuate discovery on these claims from the United States would be an enormous burden.

Second, none of the material witnesses in Honduras are subject to compulsory process, as Honduras is beyond the 100-mile subpoena power exercised by this court. *See* Fed. R. Civ. P. 45(c)(1)(A).

Third, the cost of bringing the individual plaintiffs and representative class members from Honduras to Delaware would be costly, if not prohibitively so. Beyond the travel costs, the witnesses will likely require English language interpreters in order to present live testimony before this Court. Conversely, there is no comparable burden in conducting the matter in Honduras. Plaintiffs identify no material witnesses residing in Delaware. Even if some exist and would need to appear in-person before the Honduran court, far fewer witnesses from the United States would need to travel to Honduras than vice versa.

Fourth, site visits for a "view of [the] premises" by the Court, including the boundary lines under dispute for several of plaintiffs' claims, including their trespass claims, would likewise be expensive and difficult. *See Trotter*, 873 F.3d at 442.

Finally, "all other practical problems that make trial of a case easy, expeditious and inexpensive" heavily favor having the case heard in Honduras. *Id*. By contrast, this court would be obliged to spend considerable time familiarizing itself both with the subject matter of the case and with the complexities of Honduran law. *See infra*.

For all of the foregoing reasons, Honduras is the proper forum for this case.

D. The public interest factors weigh strongly in favor of dismissal.

The public interest factors likewise weigh strongly in favor of dismissal. The public interest factors include: the possibility of turning courts into "congested centers;" the likelihood that the case will burden a jury composed of people with "no relation to the litigation;" the probability that the case will "touch the affairs of many persons" in the community; and the

chances that the court will be "at home with the . . . law that must govern the case." *Trotter*, 873 F.3d at 442 (quoting *Gulf Oil Corp.*, 330 U.S. at 508). In evaluating the public interest factors the district court must "consider the locus of the alleged culpable conduct, often a disputed issue, and the connection of that conduct to plaintiff's chosen forum." *Lacey v. Cessna Aircraft Co.*, 862 F.2d 38, 48 (3d Cir. 1988) (citation omitted).

In this case, all of the public interest factors weigh in favor of litigation in the Honduran courts. To begin, there is significant congestion in the Delaware courts, as IFC AMC amply demonstrated in its motion to transfer. D.I. 24 at 13, Ex. D. The claims raised by Plaintiffs also will not touch the affairs of "many persons" in Delaware, but instead the claims directly (and entirely) affect the Bajo Aguán region of Honduras, its communities, and its land. Likewise, the "locus" of the culpable conduct is also the Bajo Aguán.

Finally, this Court will not be "at home with" the law of Honduras, *Trotter*, 873 F.3d at 442, and so "the need to apply foreign law points toward dismissal," *Lacey*, 862 F.2d at 48. Plaintiffs attempt to inject uncertainty into the applicable law, invoking "the laws of Delaware, United States federal common law, Honduran law, and the laws of any other jurisdiction that might apply." D.I 1 ¶ 430. But Delaware has adopted the "most significant relationship" test for its choice of law analysis, which likely indicates that Honduran law will apply in this case. *See Tumlinson v. Advanced Micro Devices, Inc.*, 106 A.3d 983, 987–88 (Del. 2013); *see also Day & Zimmermann, Inc. v. Challoner*, 423 U.S. 3, 3–4 (1975) (per curiam) (directing federal courts to apply forum state's choice of law rules, even when those rules mandate application of the substantive law of a foreign country).

CONCLUSION

For the foregoing reasons, this Court should dismiss Plaintiffs' complaint with prejudice.

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IFC Asset Management Company, LLC

Dated: February 16, 2018

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

JUANA DOE I et al.,	§	
	§	
Plaintiffs,	§	
	§	
vs.	§	
	§	C.A. No. 17-1494-VAC-SRF
IFC ASSET MANAGEMENT COMPANY, LLC,	§	
	§	
	§	
Defendant.	§	

DECLARATION OF MATTHEW LETTEN IN SUPPORT OF DEFENDANT'S MOTION TO DISMISS

I, Matthew Letten, declare and state:

1. I am one of the attorneys representing IFC Asset Management Company, LLC ("IFC AMC"). I submit this Declaration in support of IFC AMC's Motion to Dismiss.

2. Attached as Exhibit A is a true and correct copy of Articles of Agreement of the International Finance Corporation art. I, Dec. 5, 1955, 7 U.S.T. 2197.

3. Attached as Exhibit B is a true and correct copy of the Declaration of Jaime Turcios.

4. Attached as Exhibit C is a true and correct copy of the European Space Agency, *Annual Report 2015* (July 13, 2017), http://esamultimedia.esa.int/multimedia/publications/Annual-Report-2015/offline/download.pdf.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 16th day of February 2018 in Washington, D.C.

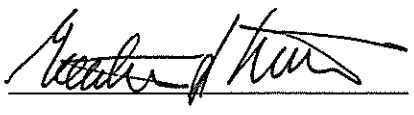

Exhibit A

MULTILATERAL

Articles of Agreement of the International Finance Corporation

Open for signature at the International Bank for Reconstruction and Development, Washington
Signed on behalf of the United States of America December 5, 1955,
Acceptance of the United States of America deposited December 5, 1955,
Entered into force July 20, 1956

International Finance Corporation

Articles of Agreement [1]

[1] The text printed herein, including signatures and Schedule A, is as certified by the Secretary of the International Bank for Reconstruction and Development on Dec 7, 1955

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Articles of Agreement of the International Finance Corporation

The Governments on whose behalf this Agreement is signed agree as follows:

INTRODUCTORY ARTICLE

The INTERNATIONAL FINANCE CORPORATION (hereinafter called the Corporation) is established and shall operate in accordance with the following provisions:

ARTICLE I

Purpose

The purpose of the Corporation is to further economic development by encouraging the growth of productive private enterprise in member countries, particularly in the less developed areas, thus supplementing the activities of the International Bank for Reconstruction and Development (hereinafter called the Bank) In carrying out this purpose, the Corporation shall·

(i) in association with private investors, assist in financing the establishment, improvement and expansion of productive private enterprises which would contribute to the development of its member countries by making investments, without guarantee of repayment by the member government concerned, in cases where sufficient private capital is not available on reasonable terms;

(ii) seek to bring together investment opportunities, domestic and foreign private capital, and experienced management, and

(iii) seek to stimulate, and to help create conditions conducive to, the flow of private capital, domestic and foreign, into productive investment in member countries

The Corporation shall be guided in all its decisions by the provisions of this Article

ARTICLE II

Membership and Capital

SECTION 1. *Membership*

(a) The original members of the Corporation shall be those members of the Bank listed in Schedule A hereto which shall, on or before the date specified in Article IX, Section 2(c), accept membership in the Corporation.

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(b) Membership shall be open to other members of the Bank at such times and in accordance with such terms as may be prescribed by the Corporation.

SECTION 2 *Capital Stock*

(a) The authorized capital stock of the Corporation shall be $100,000,000, in terms of United States dollars.

(b) The authorized capital stock shall be divided into 100,000 shares having a par value of one thousand United States dollars each Any such shares not initially subscribed by original members shall be available for subsequent subscription in accordance with Section 3(d) of this Article.

(c) The amount of capital stock at any time authorized may be increased by the Board of Governors as follows:

(i) by a majority of the votes cast, in case such increase is necessary for the purpose of issuing shares of capital stock on initial subscription by members other than original members, provided that the aggregate of any increases authorized pur-

suant to this subparagraph shall not exceed 10,000 shares;

(ii) in any other case, by a three-fourths majority of the total voting power

(d) In case of an increase authorized pursuant to paragraph (c)(ii) above, each member shall have a reasonable opportunity to subscribe, under such conditions as the Corporation shall decide, to a proportion of the increase of stock equivalent to the proportion which its stock theretofore subscribed bears to the total capital stock of the Corporation, but no member shall be obligated to subscribe to any part of the increased capital

(e) Issuance of shares of stock, other than those subscribed either on initial subscription or pursuant to paragraph (d) above, shall require a three-fourths majority of the total voting power.

(f) Shares of stock of the Corporation shall be available for subscription only by, and shall be issued only to, members.

SECTION 3. *Subscriptions*

(a) Each original member shall subscribe to the number of shares of stock set forth opposite its name in Schedule A. The number of shares of stock to be subscribed by other members shall be determined by the Corporation.

(b) Shares of stock initially subscribed by original members shall be issued at par.

(c) The initial subscription of each original member shall be payable in full within 30 days after either the date on which the Corporation shall begin operations pursuant to Article IX, Section 3(b), or the date on which such original member becomes a member, whichever shall be later, or at such date thereafter as the Corporation shall determine. Payment shall be made in gold or United States dol-

lars in response to a call by the Corporation which shall specify the place or places of payment.

(d) The price and other terms of subscription of shares of stock to be subscribed, otherwise than on initial subscription by original members, shall be determined by the Corporation.

SECTION 4. *Limitation on Liability*

No member shall be liable, by reason of its membership, for obligations of the Corporation.

SECTION 5 *Restriction on Transfers and Pledges of Shares*

Shares of stock shall not be pledged or encumbered in any manner whatever, and shall be transferable only to the Corporation.

ARTICLE III

Operations

SECTION 1. *Financing Operations*

The Corporation may make investments of its funds in productive private enterprises in the territories of its members. The existence of a government or other public interest in such an enterprise shall not necessarily preclude the Corporation from making an investment therein.

SECTION 2. *Forms of Financing*

(a) The Corporation's financing shall not take the form of investments in capital stock. Subject to the foregoing, the Corporation may make investments of its funds in such form or forms as it may deem appropriate in the circumstances, including (but without limitation) investments according to the holder thereof the right to participate in earnings and the right to subscribe to, or to convert the investment into, capital stock.

(b) The Corporation shall not itself exercise any right to subscribe to, or to convert any investment into, capital stock.

SECTION 3 *Operational Principles*

The operations of the Corporation shall be conducted in accordance with the following principles.

(i) the Corporation shall not undertake any financing for which in its opinion sufficient private capital could be obtained on reasonable terms;

(ii) the Corporation shall not finance an enterprise in the territories of any member if the member objects to such financing,

(iii) the Corporation shall impose no conditions that the proceeds of any financing by it shall be spent in the territories of any particular country,

(iv) the Corporation shall not assume responsibility for managing any enterprise in which it has invested;

(v) the Corporation shall undertake its financing on terms and conditions which it considers appropriate, taking into account the requirements of the enterprise, the risks being undertaken by the Corporation and the terms and conditions normally obtained by private investors for similar financing;

(vi) the Corporation shall seek to revolve its funds by selling its investments to private investors whenever it can appropriately do so on satisfactory terms,

(vii) the Corporation shall seek to maintain a reasonable diversification in its investments.

SECTION 4. *Protection of Interests*

Nothing in this Agreement shall prevent the Corporation, in the event of actual or threatened default on any of its

investments, actual or threatened insolvency of the enterprise in which such investment shall have been made, or other situations which, in the opinion of the Corporation, threaten to jeopardize such investment, from taking such action and exercising such rights as it may deem necessary for the protection of its interests

SECTION 5. *Applicability of Certain Foreign Exchange Restrictions*

Funds received by or payable to the Corporation in respect of an investment of the Corporation made in any member's territories pursuant to Section 1 of this Article shall not be free, solely by reason of any provision of this Agreement, from generally applicable foreign exchange restrictions, regulations and controls in force in the territories of that member.

SECTION 6. *Miscellaneous Operations*

In addition to the operations specified elsewhere in this Agreement, the Corporation shall have the power to

(i) borrow funds, and in that connection to furnish such collateral or other security therefor as it shall determine; provided, however, that before making a public sale of its obligations in the markets of a member, the Corporation shall have obtained the approval of that member and of the member in whose currency the obligations are to be denominated;

(ii) invest funds not needed in its financing operations in such obligations as it may determine and invest funds held by it for pension or similar purposes in any marketable securities, all without being subject to the restrictions imposed by other sections of this Article,

(iii) guarantee securities in which it has invested in order to facilitate their sale,

(iv) buy and sell securities it has issued or guaranteed or in which it has invested;

(v) exercise such other powers incidental to its business as shall be necessary or desirable in furtherance of its purposes

SECTION 7 *Valuation of Currencies*

Whenever it shall become necessary under this Agreement to value any currency in terms of the value of another currency, such valuation shall be as reasonably determined by the Corporation after consultation with the International Monetary Fund.

SECTION 8 *Warning To Be Placed on Securities*

Every security issued or guaranteed by the Corporation shall bear on its face a conspicuous statement to the effect that it is not an obligation of the Bank or, unless expressly stated on the security, of any government.

SECTION 9. *Political Activity Prohibited*

The Corporation and its officers shall not interfere in the political affairs of any member, nor shall they be influenced in their decisions by the political character of the member or members concerned. Only economic considerations shall be relevant to their decisions, and these considerations shall be weighed impartially in order to achieve the purposes stated in this Agreement.

ARTICLE IV

Organization and Management

SECTION 1. *Structure of the Corporation*

The Corporation shall have a Board of Governors, a Board of Directors, a Chairman of the Board of Directors, a President and such other officers and staff to perform such duties as the Corporation may determine.

SECTION 2. *Board of Governors*

(a) All the powers of the Corporation shall be vested in the Board of Governors

(b) Each Governor and Alternate Governor of the Bank appointed by a member of the Bank which is also a member of the Corporation shall *ex officio* be a Governor or Alternate Governor, respectively, of the Corporation No Alternate Governor may vote except in the absence of his principal The Board of Governors shall select one of the Governors as Chairman of the Board of Governors. Any Governor or Alternate Governor shall cease to hold office if the member by which he was appointed shall cease to be a member of the Corporation

(c) The Board of Governors may delegate to the Board of Directors authority to exercise any of its powers, except the power to:

(i) admit new members and determine the conditions of their admission;

(ii) increase or decrease the capital stock;

(iii) suspend a member,

(iv) decide appeals from interpretations of this Agreement given by the Board of Directors;

(v) make arrangements to cooperate with other international organizations (other than informal arrangements of a temporary and administrative character),

(vi) decide to suspend permanently the operations of the Corporation and to distribute its assets;

(vii) declare dividends;

(viii) amend this Agreement.

(d) The Board of Governors shall hold an annual meeting and such other meetings as may be provided for by the Board of Governors or called by the Board of Directors.

(e) The annual meeting of the Board of Governors shall be held in conjunction with the annual meeting of the Board of Governors of the Bank.

(f) A quorum for any meeting of the Board of Governors shall be a majority of the Governors, exercising not less than two-thirds of the total voting power.

(g) The Corporation may by regulation establish a procedure whereby the Board of Directors may obtain a vote of the Governors on a specific question without calling a meeting of the Board of Governors.

(h) The Board of Governors, and the Board of Directors to the extent authorized, may adopt such rules and regulations as may be necessary or appropriate to conduct the business of the Corporation.

(i) Governors and Alternate Governors shall serve as such without compensation from the Corporation.

SECTION 3 *Voting*

(a) Each member shall have two hundred fifty votes plus one additional vote for each share of stock held.

(b) Except as otherwise expressly provided, all matters before the Corporation shall be decided by a majority of the votes cast.

SECTION 4. *Board of Directors*

(a) The Board of Directors shall be responsible for the conduct of the general operations of the Corporation, and for this purpose shall exercise all the powers given to it by this Agreement or delegated to it by the Board of Governors.

(b) The Board of Directors of the Corporation shall be composed *ex officio* of each Executive Director of the Bank who shall have been either (i) appointed by a member of the Bank which is also a member of the Corporation, or (ii) elected in an election in which the votes of at least one

member of the Bank which is also a member of the Corporation shall have counted toward his election The Alternate to each such Executive Director of the Bank shall *ex officio* be an Alternate Director of the Corporation. Any Director shall cease to hold office if the member by which he was appointed, or if all the members whose votes counted toward his election, shall cease to be members of the Corporation.

(c) Each Director who is an appointed Executive Director of the Bank shall be entitled to cast the number of votes which the member by which he was so appointed is entitled to cast in the Corporation Each Director who is an elected Executive Director of the Bank shall be entitled to cast the number of votes which the member or members of the Corporation whose votes counted toward his election in the Bank are entitled to cast in the Corporation All the votes which a Director is entitled to cast shall be cast as a unit.

(d) An Alternate Director shall have full power to act in the absence of the Director who shall have appointed him. When a Director is present, his Alternate may participate in meetings but shall not vote.

(e) A quorum for any meeting of the Board of Directors shall be a majority of the Directors exercising not less than one-half of the total voting power.

(f) The Board of Directors shall meet as often as the business of the Corporation may require.

(g) The Board of Governors shall adopt regulations under which a member of the Corporation not entitled to appoint an Executive Director of the Bank may send a representative to attend any meeting of the Board of Directors of the Corporation when a request made by, or a matter particularly affecting, that member is under consideration.

SECTION 5 *Chairman, President and Staff*

(a) The President of the Bank shall be *ex officio* Chairman of the Board of Directors of the Corporation, but shall

have no vote except a deciding vote in case of an equal division He may participate in meetings of the Board of Governors but shall not vote at such meetings

(b) The President of the Corporation shall be appointed by the Board of Directors on the recommendation of the Chairman. The President shall be chief of the operating staff of the Corporation. Under the direction of the Board of Directors and the general supervision of the Chairman, he shall conduct the ordinary business of the Corporation and under their general control shall be responsible for the organization, appointment and dismissal of the officers and staff. The President may participate in meetings of the Board of Directors but shall not vote at such meetings The President shall cease to hold office by decision of the Board of Directors in which the Chairman concurs.

(c) The President, officers and staff of the Corporation, in the discharge of their offices, owe their duty entirely to the Corporation and to no other authority. Each member of the Corporation shall respect the international character of this duty and shall refrain from all attempts to influence any of them in the discharge of their duties.

(d) Subject to the paramount importance of securing the highest standards of efficiency and of technical competence, due regard shall be paid, in appointing the officers and staff of the Corporation, to the importance of recruiting personnel on as wide a geographical basis as possible.

SECTION 6. *Relationship to the Bank*

(a) The Corporation shall be an entity separate and distinct from the Bank and the funds of the Corporation shall be kept separate and apart from those of the Bank. The Corporation shall not lend to or borrow from the Bank. The provisions of this Section shall not prevent the Corporation from making arrangements with the Bank regarding facilities, personnel and services and arrangements for reimbursement of administrative expenses paid in the first instance by either organization on behalf of the other.

(b) Nothing in this Agreement shall make the Corporation liable for the acts or obligations of the Bank, or the Bank liable for the acts or obligations of the Corporation.

SECTION 7 *Relations With Other International Organizations*

The Corporation, acting through the Bank, shall enter into formal arrangements with the United Nations and may enter into such arrangements with other public international organizations having specialized responsibilities in related fields.

SECTION 8. *Location of Offices*

The principal office of the Corporation shall be in the same locality as the principal office of the Bank The Corporation may establish other offices in the territories of any member

SECTION 9 *Depositories*

Each member shall designate its central bank as a depository in which the Corporation may keep holdings of such member's currency or other assets of the Corporation or, if it has no central bank, it shall designate for such purpose such other institution as may be acceptable to the Corporation.

SECTION 10. *Channel of Communication*

Each member shall designate an appropriate authority with which the Corporation may communicate in connection with any matter arising under this Agreement.

SECTION 11. *Publication of Reports and Provision of Information*

(a) The Corporation shall publish an annual report containing an audited statement of its accounts and shall circulate to members at appropriate intervals a summary statement of its financial position and a profit and loss statement showing the results of its operations.

(b) The Corporation may publish such other reports as it deems desirable to carry out its purposes

(c) Copies of all reports, statements and publications made under this Section shall be distributed to members

SECTION 12 *Dividends*

(a) The Board of Governors may determine from time to time what part of the Corporation's net income and surplus, after making appropriate provision for reserves, shall be distributed as dividends

(b) Dividends shall be distributed *pro rata* in proportion to capital stock held by members

(c) Dividends shall be paid in such manner and in such currency or currencies as the Corporation shall determine.

ARTICLE V

Withdrawal; Suspension of Membership, Suspension of Operations

SECTION 1 *Withdrawal by Members*

Any member may withdraw from membership in the Corporation at any time by transmitting a notice in writing to the Corporation at its principal office Withdrawal shall become effective upon the date such notice is received.

SECTION 2 *Suspension of Membership*

(a) If a member fails to fulfill any of its obligations to the Corporation, the Corporation may suspend its membership by decision of a majority of the Governors, exercising a majority of the total voting power The member so suspended shall automatically cease to be a member one year from the date of its suspension unless a decision is taken by the same majority to restore the member to good standing.

(b) While under suspension, a member shall not be entitled to exercise any rights under this Agreement except the right of withdrawal, but shall remain subject to all obligations

SECTION 3 *Suspension or Cessation of Membership in the Bank*

Any member which is suspended from membership in, or ceases to be a member of, the Bank shall automatically be suspended from membership in, or cease to be a member of, the Corporation, as the case may be

SECTION 4. *Rights and Duties of Governments Ceasing To Be Members*

(a) When a government ceases to be a member it shall remain liable for all amounts due from it to the Corporation. The Corporation shall arrange for the repurchase of such government's capital stock as a part of the settlement of accounts with it in accordance with the provisions of this Section, but the government shall have no other rights under this Agreement except as provided in this Section and in Article VIII (c).

(b) The Corporation and the government may agree on the repurchase of the capital stock of the government on such terms as may be appropriate under the circumstances, without regard to the provisions of paragraph (c) below Such agreement may provide, among other things, for a final settlement of all obligations of the government to the Corporation

(c) If such agreement shall not have been made within six months after the government ceases to be a member or such other time as the Corporation and such government may agree, the repurchase price of the government's capital stock shall be the value thereof shown by the books of the Corporation on the day when the government ceases to be a member The repurchase of the capital stock shall be subject to the following conditions:

(i) payments for shares of stock may be made from time to time, upon their surrender by the government, in such instalments, at such times and in such available currency or currencies as the Corporation reasonably determines, taking into account the financial position of the Corporation;

(ii) any amount due to the government for its capital stock shall be withheld so long as the government or any of its agencies remains liable to the Corporation for payment of any amount and such amount may, at the option of the Corporation, be set off, as it becomes payable, against the amount due from the Corporation,

(iii) if the Corporation sustains a net loss on the investments made pursuant to Article III, Section 1, and held by it on the date when the government ceases to be a member, and the amount of such loss exceeds the amount of the reserves provided therefor on such date, such government shall repay on demand the amount by which the repurchase price of its shares of stock would have been reduced if such loss had been taken into account when the repurchase price was determined.

(d) In no event shall any amount due to a government for its capital stock under this Section be paid until six months after the date upon which the government ceases to be a member. If within six months of the date upon which any government ceases to be a member the Corporation suspends operations under Section 5 of this Article, all rights of such government shall be determined by the provisions of such Section 5 and such government shall be considered still a member of the Corporation for purposes of such Section 5, except that it shall have no voting rights.

SECTION 5. *Suspension of Operations and Settlement of Obligations*

(a) The Corporation may permanently suspend its operations by vote of a majority of the Governors exercising a majority of the total voting power After such suspension of operations the Corporation shall forthwith cease all activities, except those incident to the orderly realization, conservation and preservation of its assets and settlement of its obligations Until final settlement of such obligations and distribution of such assets, the Corporation shall remain in existence and all mutual rights and obligations of the Corporation and its members under this Agreement shall continue unimpaired, except that no member shall be suspended or withdraw and that no distribution shall be made to members except as in this Section provided

(b) No distribution shall be made to members on account of their subscriptions to the capital stock of the Corporation until all liabilities to creditors shall have been discharged or provided for and until the Board of Governors, by vote of a majority of the Governors exercising a majority of the total voting power, shall have decided to make such distribution

(c) Subject to the foregoing, the Corporation shall distribute the assets of the Corporation to members *pro rata* in proportion to capital stock held by them, subject, in the case of any member, to prior settlement of all outstanding claims by the Corporation against such member. Such distribution shall be made at such times, in such currencies, and in cash or other assets as the Corporation shall deem fair and equitable. The shares distributed to the several members need not necessarily be uniform in respect of the type of assets distributed or of the currencies in which they are expressed

(d) Any member receiving assets distributed by the Corporation pursuant to this Section shall enjoy the same rights with respect to such assets as the Corporation enjoyed prior to their distribution

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ARTICLE VI

Status, Immunities and Privileges

SECTION 1. *Purposes of Article*

To enable the Corporation to fulfill the functions with which it is entrusted, the status, immunities and privileges set forth in this Article shall be accorded to the Corporation in the territories of each member.

SECTION 2 *Status of the Corporation*

The Corporation shall possess full juridical personality and, in particular, the capacity.

(i) to contract;

(ii) to acquire and dispose of immovable and movable property;

(iii) to institute legal proceedings.

SECTION 3. *Position of the Corporation with Regard to Judicial Process*

Actions may be brought against the Corporation only in a court of competent jurisdiction in the territories of a member in which the Corporation has an office, has appointed an agent for the purpose of accepting service or notice of process, or has issued or guaranteed securities No actions shall, however, be brought by members or persons acting for or deriving claims from members The property and assets of the Corporation shall, wheresoever located and by whomsoever held, be immune from all forms of seizure, attachment or execution before the delivery of final judgment against the Corporation.

SECTION 4. *Immunity of Assets from Seizure*

Property and assets of the Corporation, wherever located and by whomsoever held, shall be immune from search,

requisition, confiscation, expropriation or any other form of seizure by executive or legislative action

SECTION 5. *Immunity of Archives*

The archives of the Corporation shall be inviolable

SECTION 6. *Freedom of Assets from Restrictions*

To the extent necessary to carry out the operations provided for in this Agreement and subject to the provisions of Article III, Section 5, and the other provisions of this Agreement, all property and assets of the Corporation shall be free from restrictions, regulations, controls and moratoria of any nature.

SECTION 7. *Privilege for Communications*

The official communications of the Corporation shall be accorded by each member the same treatment that it accords to the official communications of other members

SECTION 8. *Immunities and Privileges of Officers and Employees*

All Governors, Directors, Alternates, officers and employees of the Corporation

(i) shall be immune from legal process with respect to acts performed by them in their official capacity;

(ii) not being local nationals, shall be accorded the same immunities from immigration restrictions, alien registration requirements and national service obligations and the same facilities as regards exchange restrictions as are accorded by members to the representatives, officials, and employees of comparable rank of other members,

(iii) shall be granted the same treatment in respect of travelling facilities as is accorded by members to representatives, officials and employees of comparable rank of other members

SECTION 9. *Immunities from Taxation*

(a) The Corporation, its assets, property, income and its operations and transactions authorized by this Agreement, shall be immune from all taxation and from all customs duties. The Corporation shall also be immune from liability for the collection or payment of any tax or duty.

(b) No tax shall be levied on or in respect of salaries and emoluments paid by the Corporation to Directors, Alternates, officials or employees of the Corporation who are not local citizens, local subjects, or other local nationals.

(c) No taxation of any kind shall be levied on any obligation or security issued by the Corporation (including any dividend or interest thereon) by whomsoever held:

(i) which discriminates against such obligation or security solely because it is issued by the Corporation; or

(ii) if the sole jurisdictional basis for such taxation is the place or currency in which it is issued, made payable or paid, or the location of any office or place of business maintained by the Corporation.

(d) No taxation of any kind shall be levied on any obligation or security guaranteed by the Corporation (including any dividend or interest thereon) by whomsoever held:

(i) which discriminates against such obligation or security solely because it is guaranteed by the Corporation; or

(ii) if the sole jurisdictional basis for such taxation is the location of any office or place of business maintained by the Corporation.

SECTION 10 *Application of Article*

Each member shall take such action as is necessary in its own territories for the purpose of making effective in terms of its own law the principles set forth in this Article and

shall inform the Corporation of the detailed action which it has taken.

SECTION 11 *Waiver*

The Corporation in its discretion may waive any of the privileges and immunities conferred under this Article to such extent and upon such conditions as it may determine.

ARTICLE VII

Amendments

(a) This Agreement may be amended by vote of three-fifths of the Governors exercising four-fifths of the total voting power.

(b) Notwithstanding paragraph (a) above, the affirmative vote of all Governors is required in the case of any amendment modifying

(i) the right to withdraw from the Corporation provided in Article V, Section 1;

(ii) the pre-emptive right secured by Article II, Section 2(d);

(iii) the limitation on liability provided in Article II, Section 4.

(c) Any proposal to amend this Agreement, whether emanating from a member, a Governor or the Board of Directors, shall be communicated to the Chairman of the Board of Governors who shall bring the proposal before the Board of Governors. When an amendment has been duly adopted, the Corporation shall so certify by formal communication addressed to all members Amendments shall enter into force for all members three months after the date of the formal communication unless the Board of Governors shall specify a shorter period.

ARTICLE VIII

Interpretation and Arbitration

(a) Any question of interpretation of the provisions of this Agreement arising between any member and the Corporation or between any members of the Corporation shall be submitted to the Board of Directors for its decision If the question particularly affects any member of the Corporation not entitled to appoint an Executive Director of the Bank, it shall be entitled to representation in accordance with Article IV, Section 4(g).

(b) In any case where the Board of Directors has given a decision under (a) above, any member may require that the question be referred to the Board of Governors, whose decision shall be final. Pending the result of the reference to the Board of Governors, the Corporation may, so far as it deems necessary, act on the basis of the decision of the Board of Directors

(c) Whenever a disagreement arises between the Corporation and a country which has ceased to be a member, or between the Corporation and any member during the permanent suspension of the Corporation, such disagreement shall be submitted to arbitration by a tribunal of three arbitrators, one appointed by the Corporation, another by the country involved and an umpire who, unless the parties otherwise agree, shall be appointed by the President of the International Court of Justice or such other authority as may have been prescribed by regulation adopted by the Corporation The umpire shall have full power to settle all questions of procedure in any case where the parties are in disagreement with respect thereto

ARTICLE IX

Final Provisions

SECTION 1. *Entry into Force* [1]

This Agreement shall enter into force when it has been signed on behalf of not less than 30 governments whose subscriptions comprise not less than 75 percent of the total subscriptions set forth in Schedule A and when the instruments referred to in Section 2(a) of this Article have been deposited on their behalf, but in no event shall this Agreement enter into force before October 1, 1955

SECTION 2 *Signature*

(a) Each government on whose behalf this Agreement is signed shall deposit with the Bank an instrument setting forth that it has accepted this Agreement without reservation in accordance with its law and has taken all steps necessary to enable it to carry out all of its obligations under this Agreement.

(b) Each government shall become a member of the Corporation as from the date of the deposit on its behalf of the instrument referred to in paragraph (a) above except that no government shall become a member before this Agreement enters into force under Section 1 of this Article

(c) This Agreement shall remain open for signature until the close of business on December 31, 1956, at the principal office of the Bank on behalf of the governments of the countries whose names are set forth in Schedule A

(d) After this Agreement shall have entered into force, it shall be open for signature on behalf of the government of any country whose membership has been approved pursuant to Article II, Section 1(b).

[1] July 20, 1956

SECTION 3 *Inauguration of the Corporation*

(a) As soon as this Agreement enters into force under Section 1 of this Article the Chairman of the Board of Directors shall call a meeting of the Board of Directors.

(b) The Corporation shall begin operations on the date when such meeting is held.

(c) Pending the first meeting of the Board of Governors, the Board of Directors may exercise all the powers of the Board of Governors except those reserved to the Board of Governors under this Agreement

DONE at Washington, in a single copy which shall remain deposited in the archives of the International Bank for Reconstruction and Development, which has indicated by its signature below its agreement to act as depository of this Agreement and to notify all governments whose names are set forth in Schedule A of the date when this Agreement shall enter into force under Article IX, Section 1 hereof.

International Bank for Reconstruction
+ Development
Eugene R Black
President

FOR CUBA

MAY 25, 1955

FOR PANAMA [1]

MAY 25, 1955

FOR COSTA RICA [2]

MAY 25, 1955

FOR MEXICO [3]

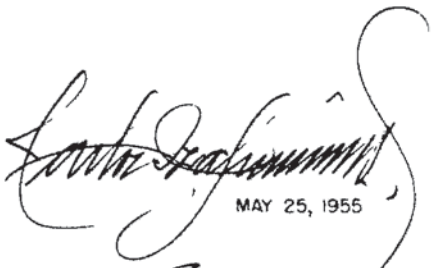
MAY 25, 1955

FOR DOMINICAN REPUBLIC [4]

MAY 25, 1955

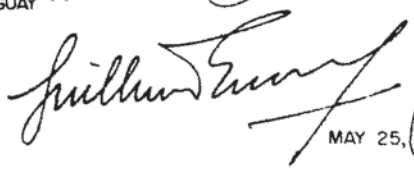
[1] Acceptance deposited Feb 27, 1956
[2] Acceptance deposited Jan 5, 1956
[3] Acceptance deposited Dec 30, 1955
[4] Acceptance deposited Feb 21, 1956

FOR HONDURAS [1]



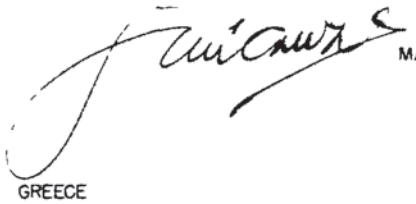
MAY 25, 1955

FOR PARAGUAY [2]



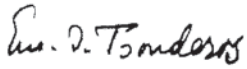
MAY 25, 1955

FOR GUATEMALA [3]



MAY 25, 1955

FOR GREECE



MAY 25, 1955

FOR PERU [4]

MAY 25, 1955

[1] Acceptance deposited Apr 16, 1956
[2] Acceptance deposited July 27, 1956
[3] Acceptance deposited Mar 14, 1956
[4] Acceptance deposited Feb 6, 1956

FOR NICARAGUA [1]

MAY 25, 1955

FOR COLOMBIA [2]

MAY 25, 1955

FOR CHILE

MAY 25, 1955

FOR HAITI [3]

MAY 25, 1955

FOR ECUADOR [4]

June 1st/955.

[1] Acceptance deposited Mar 14, 1956
[2] Acceptance deposited July 16, 1956
[3] Acceptance deposited Mar 9, 1956
[4] Acceptance deposited Dec 5, 1955

FOR PAKISTAN [1]

V Ameed Ag

21 July 1955

FOR ICELAND [2]

Thor Thors

18 August 1955

FOR INDIA [3]

G L Mehta

19 October 1955

FOR UNITED KINGDOM [4]

25th October 1955

FOR CANADA [5]

25th October, 1955

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[1] Acceptance deposited May 18, 1956
[2] Acceptance deposited Aug 18, 1955
[3] Acceptance deposited Apr 18, 1956
[4] Acceptance deposited Jan 3, 1956
[5] Acceptance deposited Oct 25, 1955

FOR AUSTRIA

FOR UNITED STATES [1]

[1] **Acceptance** deposited Dec 5, 1955

SCHEDULE A

Subscriptions to Capital Stock of the International Finance Corporation

Country	*Number of Shares*	*Amount (in United States dollars)*
Australia	2,215	2,215,000
Austria	554	554,000
Belgium	2,492	2,492,000
Bolivia	78	78,000
Brazil	1,163	1,163,000
Burma	166	166,000
Canada	3,600	3,600,000
Ceylon	166	166,000
Chile	388	388,000
China	6,646	6,646,000
Colombia	388	388,000
Costa Rica	22	22,000
Cuba	388	388,000
Denmark	753	753,000
Dominican Republic	22	22,000
Ecuador	35	35,000
Egypt	590	590,000
El Salvador	11	11,000
Ethiopia	33	33,000
Finland	421	421,000
France	5,815	5,815,000
Germany	3,655	3,655,000
Greece	277	277,000
Guatemala	22	22,000
Haiti	22	22,000
Honduras	11	11,000
Iceland	11	11,000
India	4,431	4,431,000
Indonesia	1,218	1,218,000
Iran	372	372,000
Iraq	67	67,000

Country	*Number of Shares*	*Amount (in United States dollars)*
Israel	50	50,000
Italy	1,994	1,994,000
Japan	2,769	2,769,000
Jordan	33	33,000
Lebanon	50	50,000
Luxembourg	111	111,000
Mexico	720	720,000
Netherlands	3,046	3,046,000
Nicaragua	9	9,000
Norway	554	554,000
Pakistan	1,108	1,108,000
Panama	2	2,000
Paraguay	16	16,000
Peru	194	194,000
Philippines	166	166,000
Sweden	1,108	1,108,000
Syria	72	72,000
Thailand	139	139,000
Turkey	476	476,000
Union of South Africa	1,108	1,108,000
United Kingdom	14,400	14,400,000
United States	35,168	35,168,000
Uruguay	116	116,000
Venezuela	116	116,000
Yugoslavia	443	443,000
Total:	**100,000**	**$100,000,000**

Note by the Department of State

In addition to the countries which became parties to the Articles of Agreement by signature thereof and deposit of instruments of acceptance as indicated on pages 25–29, the following countries have become parties by virtue of signature of the Articles of Agreement and deposit of instruments of acceptance, on the dates indicated

Country	*Articles Signed*	*Acceptance Deposited*
Australia	Dec 23, 1955	Dec 23, 1955
Bolivia	Apr 2, 1956	Apr 2, 1956
Ceylon	Feb 27, 1956	Feb 27, 1956
Denmark	June 18, 1956	June 18, 1956
Egypt	Dec 16, 1955	Dec 16, 1955
El Salvador	May 4, 1956	May 4, 1956
Ethiopia	Jan 26, 1956	Jan 26, 1956
Finland	June 22, 1956	June 22, 1956
France	July 20, 1956	July 20, 1956
Germany, Federal Republic of	July 20, 1956	July 20 1956
Japan	June 15, 1956	June 15, 1956
Jordan	May 28, 1956	May 28, 1956
Norway	June 11, 1956	June 11, 1956
Sweden	June 6, 1956	June 6, 1956

Exhibit B

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

JUANA DOE I et al.,	§	
	§	
Plaintiffs,	§	
	§	
vs.	§	
	§	C.A. No. 17-1494-VAC-SRF
IFC ASSET MANAGEMENT COMPANY, LLC,	§	
	§	
	§	
Defendant.	§	

DECLARATION OF JAIME TURCIOS

I, Jaime Turcios, declare and state:

1. I am a citizen of the Republic of Honduras ("Honduras") and reside at Torre Vista 1432, Colonia Lomas del Mayab, Tegucigalpa, Honduras. I am a practicing attorney in Honduras. I have been requested to provide this affidavit by the IFC Asset Management Company (IFC AMC) in connection with case 1 C.A. No. 17-1494-VAC-SRF filed by Plaintiffs against IFC AMC.

2. I received a law degree from the University of Navarre in Spain in the year 2008. I received an LL.M degree with honors from Northwestern University in Chicago, IL in the year 2011. I was admitted to practice law in Honduras in 2010 and was admitted as a Notary Public by the Honduran Supreme Court in the year 2017. I have been practicing law in Honduras for 10 years and am fluent in English.

3. I am personally familiar with the matters stated below, which are set forth to the best of my knowledge and understanding. I have also reviewed the Complaint in the case C.A. No. 17-1494-VAC-SRF and am familiar with the allegations made in it.

4. The Washington D.C. office of Sidley & Austin LLP, a law firm retained by IFC AMC, asked me to review the complaint and offer my opinion on various aspects of Honduran law.

5. Subject to the assumptions and qualifications I submit, the contests of this Affidavits are a true statement of my opinion as to matters of Honduran Law.

6. I have been asked to provide my professional opinion on (i) the availability of relief for each of Plaintiffs' claims in the Honduran court system, even if the procedures or type of relief are different than what is available under U.S. law; (ii) the elements of the claims under Honduran Law; and (iii) the statute of limitations for each of the Plaintiffs claims under Honduran Law.

7. The statements made by me in this affidavit are based on my review of only the complaint filed in this case and my understanding of Honduran law.

8. For the purpose of this affidavit, I have made the following assumptions, without making any investigation hereof:

    a) That the copies of documents provided to me are complete and accurate copies of the originals.
    b) That the signature and seal on the Complaint submitted to me are genuine.

9. For the purpose of this affidavit, I am also assuming that the Plaintiffs' factual allegations are true, although I have made no investigation of them and I understand IFC AMC will be contesting them.

10. I have considered the most severe crimes that could apply under Honduran Law.

11. The opinion is limited to matters of Honduran law in force on the date of this affidavit.

I. Background

12. According to the Complaint, the Plaintiffs are bringing this action against IFC AMC seeking on behalf of themselves and their deceased family members, compensatory

damages, punitive damages and injunctive relief to remedy alleged murders, torture, assault, battery, trespass, unjust enrichment, and other acts of aggression committed, sponsored, and abetted by Dinant which was and continues to be funded and supported by IFC AMC and its parent company, the IFC. Complaint ¶1.

13. The Plaintiffs' causes of action against IFC AMC are the following: (i) Assault; (ii) Battery; (iii) Intentional Infliction of Emotional Distress; (iv) False Imprisonment; (v) Negligent Infliction of Emotional Distress; (vi) Negligence; (vii) Trespass; (viii) Unjust enrichment; (ix) Wrongful Death.

II. Allegations Against IFC AMC

14. IFC AMC is a wholly-owned subsidiary of the International Finance Corporation (the "IFC"), created in 2009 to raise money from investors alongside IFC in private enterprise and manage funds from IFC and other institutional investors. Complaint ¶14.

15. The Plaintiffs claim that IFC AMC knowingly profited and is currently profiting from Dinant's allege murder, violence and dispossession and that rather than limiting Dinant's funding, IFC AMC provided the Dinant companies with funding and that in doing this, IFC AMC has allegedly violated its own rules, U.S. Law and Honduran Law. Complaint ¶4.

16. The Plaintiffs base many of their allegations on (i) a certain loan made by the IFC to Cressida, a Honduran corporation owned at the time by Miguel Facusse, that among other things, owned palm plantations in the Bajo Aguan; (ii) a certain loan made by IFC to Dinant in 2009 for an amount of $30 million (the "Loan"); (iii) a $75 million equity investment in Banco Ficohsa (the "Ficohsa Investment"); and (iv) the guarantee of $5.3 million in loans that Ficohsa made to Dinant for "intra-firm" trades through its Global Trade Finance Program (the "Guarantees").

17. The Plaintiffs allege that at the time of IFC's initial disbursement under the Loan, IFC was required by its own policies to investigate the alleged human rights situations surrounding Dinant's occupation of the land. Complaint ¶11.

18. According to the complaint, Plaintiffs and their decedents are among the scores of farmers in the Bajo Aguan that were allegedly shot, killed and terrorized by Dinant and those working on its behalf. Complaint ¶5.

19. According to the complaint, for nearly two (2) decades, farmer cooperatives to which Plaintiffs belong have openly challenged Dinant's claims to sixteen (16) African oil palm plantations that it has held in the Bajo Aguan region. Plaintiffs claim that Dinant's owners took that land from the farmer cooperatives through fraud, coercion, and actual or threatened violence. The complaint also states that farmer cooperatives have engaged in lawsuits, political advocacy, and peaceful protests to challenge Dinant's control and use of the land and that Dinant has allegedly responded to such efforts with violence and aggression. Complaint ¶8.

20. According to the complaint, the Plaintiffs allege that IFC AMC and IFC have repeatedly and consistently provided funding (directly and through Banco Ficohsa) to Dinant, knowing that Dinant was allegedly waging a campaign of violence, terror and dispossession against farmers, and that their money would be used to aid the commission of gross human right abuses, Complaint ¶9, and that IFC AMC could have stopped such abuses by enforcing their contractual rights under the loan agreements. ¶20.

21. The Plaintiffs allege that Ficohsa was one of Dinant's largest creditors, if not its largest and IFC made the Investment with full knowledge that Ficohsa was a critical source of capital for Dinant and that Dinant was allegedly involved in a violent land conflict. Moreover, the Plaintiffs allege that IFC AMC specifically waived IFC's policies in order to allow Ficohsa to avoid reducing its lending to Dinant. Complaint ¶16.

22. The Plaintiffs allege that for the past seven (7) years IFC and IFC AMC have allowed and continue to allow Dinant to breach IFC's own polices on social responsibility, enabling and authorizing Dinant's alleged campaign of terror and eviction against the Plaintiffs and their families, Complaint ¶23, and that IFC and IFC AMC's support not only violates the laws of Honduras and the United States but it also violates IFC and IFC AMC's own policies and the standard of care in international finance. Complaint ¶25.

23. The Plaintiffs allege that IFC and IFC AMC have the power to force Dinant to stop or at least decrease the killings by calling in their Loan or taking action under their investment contracts, which include requirements that Dinant comply with IFC Environmental Standards. Complaint ¶38.

24. The Plaintiffs allege that they have been, and continue to be victims of IFC and IFC AMC's unjust enrichment. Complaint ¶455.

III. The Honduran Judicial System is an Appropriate Forum for the Resolution of Plaintiffs' claims.

25. Honduras is an adequate, available, and appropriate forum for the Plaintiffs' claims, as it's the location where the alleged harms suffered by the Plaintiffs occurred, and because Honduran courts have jurisdiction over the whole controversy.

IV. Independent Judiciary, Access to Justice and Due Process

A. Independent Judiciary

26. Honduras has an independent Judicial System. Article 303 of the Honduran Constitution (the "Constitution") provides that the magistrates and judges are independent and are only subject to the Constitution and laws. Article 4 of the Constitution also provides that the Legislative, Executive and Judicial Powers are independent and no subordination exists between them.

27. Honduras has two basic court systems: a civil and criminal system.

28. Article 7 of the Code of Criminal Procedure states that the judgment of crimes is within the exclusive jurisdiction of independent and impartial judges and magistrates who are subject to the Constitution and laws.[1]

29. Article 52 of the Code of Civil Procedure states that if a judge incurs any conflict of interest according to the Judiciary Law,[2] he must recuse himself from any judicial process.

30. Article 83 of the Code of Criminal Procedure states that the judges or magistrates can be recused if there is a legitimate cause as established by law, thus preventing any conflicts of interest.

B. Access to Justice

31. Article 80 of the Constitution guarantees that every person or association has the right to submit any petitions to the authorities either for the protection of their particular interest or the general interest and have the right to obtain a prompt response.

32. Article 1 of the Code of Civil Procedure[3] states that any person has the right to petition the courts and tribunals for the effective protection of their rights and legitimate interests. Article 2 of the Code of Civil Procedure guarantees the assistance of legal counsel of his choice in any case, designated by the State.

33. Article 3 of the Code of Civil Procedure prohibits any social, political, economic, cultural or any other obstacle that would impede of impair access to justice to any person.

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[1] The law sets forth the rules of procedure in Honduran courts in criminal actions.
[2] The law sets forth the internal mechanism of the justice system. (Decree 76)
[3] The law that sets forth the rules of procedure in Honduran Courts in civil actions and is supplementary to all other courts. (Decree 211-206)

34. Courts in Honduras will hear a case involving any Plaintiff, except in cases specifically prohibited by applicable laws, which are not at issue in this case.

35. Courts in Honduras will hear a case involving any defendant domiciled in Honduras, and will also hear any case involving foreign defendants where such foreign defendants committed acts or omissions that originate civil liability in accordance with Honduran Law. Civil Courts in Honduras have jurisdiction over any controversy that arises out of private law (civil or mercantile) and of other controversy, subject to the limitations of any international treaty or international law.

C. Due Process

36. Article 3 of the Code of Civil Procedures sets forth the Due Process guarantee by stating that the parties have a right to have their process conducted in the legally established form, to have their constitutional procedural rights respected in a condition of equality and without delay and to have a final judgment on the merits issued by a competent, independent and impartial court.

37. Article 5 of the Code of Civil Procedures states that all parties in a process are equal, having the same rights, obligations, burdens and opportunities that their status (defendant or plaintiff) affords them. This Article 5 also states that the court is obligated to preserve the equality of the parties in the process and to avoid all discrimination based on reasons of gender, race, religion, language, social condition, political condition, economic condition, or any other condition.

V. Elements of Plaintiffs' Allegations under Honduran Law

38. I have noted in the complaint that allegations have been made under doctrines of (i) Assault; (ii) Battery; (iii) Intentional Infliction of Emotional Distress; (iv) False imprisonment; (v) Negligent Infliction of Emotional Distress; (vi) Negligence; (vii) Trespass; (viii) Unjust Enrichment and (ix) Wrongful Death. Based on the claims,

Honduran courts would be a proper forum for their adjudication; however, the claims are unusual because the defendant is not the owner or operator of the companies but is only a lender.

39. I am not aware of any Honduran statute or case that would permit a lender to be held liable for these torts/claims under the circumstances alleged in the complaint. I note that Honduras is not a common law country, but instead is a civil law jurisdiction.

40. Most of the claims made by the Plaintiffs in the Complaint are typified as criminal offenses under Honduran Law. Once a crime is proven in a criminal court by a government prosecutor, victims of the crimes, and in some cases their family members, may be entitled to monetary relief for injuries caused by the crime. The Code of Criminal Procedures establishes a "fast-track" procedure in which a victim or its family is able to execute a criminal sentences and obtain money damages (the "Execution Procedure") in the civil courts.[4] I will discuss this procedure in further detail in another section.

41. I hereby provide an analysis of the claims contained in the Complaint and determine which cause of actions in Honduran law could be applicable:

A. False Imprisonment

42. The Honduran Criminal Code[5] typifies the crime of "Detencion Ilegal" (illegal detention). The elements of this crime require that a defendant intentionally and unjustly deprive a victim of his or her freedom. If a court finds a defendant guilty of this crime, the victim is entitled to provable damages by way of the Execution Procedure.

B. Assault

[4] See ¶58
[5] This law typifies all of the punishable crimes and offenses in Honduras.

43. The Honduran Criminal Code typifies the crime of "Amenazas" (Threats). The elements of this crime require that a defendant intentionally threaten to cause harm to a victim, his family, his honor or his property, even if the threatened action is a crime or not. If a court finds a defendant guilty of this crime, the victim is entitled to provable damages by the way of the Execution Procedure.

C. Battery

44. The Honduran Criminal Code typifies the crime of "Lesiones" (Injuries). The elements of this crime require that a defendant intentionally or negligently cause any harm to a victim that affects his body, physical or mental health. If a court finds a defendant guilty of this crime, the victim is entitled to provable damages by the way of the Execution Procedure.

D. Trespass

45. The Honduran Criminal Code typifies the crime of "Allanamiento de Morada" (Trespass to Abode). The elements of this crime require that a defendant enter into someone else's abode (home, property) without the owner's consent or that the defendant enters with express or implied consent, but the defendant refuses to leave. If a court finds a defendant guilty of this crime, the victim is entitled to provable damages by the way of the Execution Procedure.

E. Wrongful Death

46. The Honduran Criminal Code typifies the crime of "Homicidio" (Homicide). The elements of this crime require an intentional killing of another person. If a court finds a defendant guilty of this crime, the victim is entitled to provable damages by the way of the Execution Procedure.

47. The Honduran Criminal Code typifies the crime of "Asesinato"(Murder). The elements of this crime requires the intentional killing of another person and any of the following

elements: (i) premeditation, (ii) malice aforethought, (iii) the killings is done by means of flooding, fire (arson), poisoning, explosion, derailing, tampering with a ship, airplane or other mechanism that can cause calamity. If a court finds a defendant guilty of this crime, the victim is entitled to provable damages by the way of the Execution Procedure.

48. The Honduran Criminal code typifies the crime of "Homicidio Culposo" (negligent homicide"). The elements of this crime require a negligent or reckless killing of another person. If a court finds a defendant guilty of this crime, the victim is entitled to provable damages by the way of the Execution Procedure.

F. Intentional Infliction of Emotional Distress

49. Neither Honduran Civil Law nor Honduran Criminal Law provides a specific cause of action for intentional infliction of emotional distress. The Honduran Criminal Code does identify the crime of "Injuria" (Insults). The elements of the crime require that a defendant communicates or performs an action that intends for the dishonor, discredit or disparagement of a person. If a court finds a defendant guilty of this crime, the victim is entitled to recover any provable damages that may have been caused by emotional distress under the Execution Procedure.

G. Negligence

50. Article 1346 of the Honduran Civil Code states that civil liability arises from: (i) the law; (ii) contracts; (iii) quasi-contracts or (iv) illicit acts[6] or omissions in which negligence or recklessness are present. A plaintiff can assert a claim in a civil court if a defendant performs an illicit action (or in some cases an omission) and that action or omission causes damages to a plaintiff. The plaintiff can claim direct damages, consequential damages, including loss of profit but punitive damages are not allowed under Honduran Law. Any action for negligence must be brought in civil court.

[6] Please note that illicit acts do not necessarily entail illegal acts. An illicit act could be one that is generally disapproved in society.

H. Negligent Infliction of Emotional Distress

51. Neither Honduran Civil Law nor Honduran Criminal law provides a separate cause of action of negligent infliction of emotional distress. A cause of action could be brought under a negligence action (see above) if the plaintiff alleges that the acts or occurrences that caused the emotional distress are illicit and he can prove damages. This action must be brought in civil court.

I. Unjust Enrichment

52. Article 114 of the Honduran Criminal Code states that anyone who profited from a crime without having participated in it, has the obligation to return such amount to the impoverished party. In order to bring this cause of action, an underlying criminal conviction is a necessary condition for recovery.[7] The Plaintiff would need to bring a civil action in order to recover any amounts under this cause of action.

J. Criminal Liability Without Direct Participation in a crime and Aiding and Abetting

53. Article 32 of the Honduran Criminal Code establishes that a person can be directly liable for a criminal offense even if he did not directly carry out the criminal offense in the following cases: (i) when a person forces or directly induces someone to commit a crime or (ii) if a person cooperates with the commission of a crime and such cooperation is a necessary means to commit the crime.

54. Article 33 of the Honduran Criminal Code establishes accomplice liability. A person will be deemed an accomplice and will be criminally liable if he cooperates with the crime by means of past or contemporary actions.

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[7] There is a specific crime of unjust enrichment but the same only applies to government employees and public officials.

VI. Description Of The Necessary Procedures For The Recovery Of Damages Arising Out Of The Causes Of Action

A. The Procedure to follow in a Criminal Action

55. Article 25 of the Code of Criminal Procedure states that the Public Attorney (Ministerio Publico) has the authority to bring criminal actions against defendants. Most of the crimes established in the Honduran Criminal Code are prosecutable by the Public Attorney's own initiative but there are some crimes that have to be initiated by the affected party. Once initiated, the Public Attorney takes over the prosecution. For the purpose of this affidavit, lesser degrees of "Lesiones" (battery) are only prosecutable by private initiative. "Amenzas" (assault) can only be prosecutable by private initiative. The Public Attorney, without the need for private initiative, can prosecute all other crimes.

56. Article 49 of the Code of Criminal Procedure states that the Civil action to seek monetary damages resulting from a crime can be brought by the victim or its heirs. The civil action can be brought against the person who has been convicted the crime and is criminally liable or third parties that are civilly liable. A third party that did not directly commit a crime could be civilly liable if it breached its duties as a guardian or caretaker and the person under its care commits a crime that in turn causes civil liability.

57. Article 105 of the Honduran Criminal Code states that anyone who incurs criminal liability for a crime is also liable for civil damages. The victims of a crime or its heirs are entitled to restitution damages, damages for the cost of repair or property, moral damages, and compensatory damages.

58. Once a court finds a defendant guilty of a crime, the victim or its heirs can bring a suit in civil court to enforce the criminal sentence and recover damages (the "Executive Procedure"). This procedure for enforcing the criminal sentence can be found in the Code of Civil Procedure. The Plaintiffs in this case must submit a pleading to the court and attach the criminal sentence as well as any calculation and proof of the calculation of

damages the Plaintiffs seek to obtain. The defendant in this case can only object as to the legitimacy of the plaintiffs or the amount of damages sought.

59. If damages are proved, the court will enter a judgment stating the amount of damages the plaintiff is entitled to and an order to repossess or attach any assets of the defendant in an amount necessary to pay damages or any other equitable relief the court might find. The victim or his heirs must bring suit within five (5) years from the date that the criminal sentence is final. If suit is not brought within five (5) years, the victim or its heirs cannot make a claim under this Executive Procedure, they are precluded from using the procedure and are subject to the ordinary ten (10) year statute of limitations for civil liability and must submit a claim under the ordinary civil procedure.

B. The Procedure to Follow in Civil Causes of Action

60. In order to recover for causes of action arising out of civil liability, an ordinary declarative process under the Code of Civil Procedure must be sought by a plaintiff. Once a civil court reaches a judgment, the plaintiff must file an additional suit to execute the judgment in civil court. The execution process is shorter than the ordinary declarative process and the defendant has limited objections it can raise. The judge has the authority to repossess or attach any assets of the defendant to the extent necessary to pay the amounts awarded in the suit.

VII. Procedural Rules

~~61.~~ Article 24 of the Code of Civil Procedure states that Honduran Courts will not hear cases against defendants who have immunity of jurisdiction or execution in accordance with International Public Law.

62. Unless a Honduran court finds that either IFC or IFC AMC has immunity of jurisdiction, a Honduran Civil Court could have jurisdiction over IFC and IFC AMC as the alleged actions that caused damages to the Plaintiffs occurred in Honduras. The Honduran Courts

would have to solicit assistance from a court where IFC or IFC AMC is domiciled in order to notify them of a civil suit. IFC and IFC AMC would be entitled to raise jurisdictional defenses to Plaintiffs' claims as well as other merit-based defenses.

63. The Honduran Criminal Code states that the legal representatives of legal entities are criminally liable for the crimes committed in the name and on behalf of the legal entities that they represent, however, any civil liability related to the crime will be paid by the legal entity.

VIII. Statute of Limitations

A. Statute of Limitations for the Criminal Causes of Action

64. There is no tolling for statute of limitations for any incapacity a plaintiff might suffer.

65. The statute of limitations for False Imprisonment (Detencion Ilegal) is nine (9) years in accordance with the Honduran Criminal Code.

66. The statute of limitations for Assault (amenzas) is three (3) years in accordance with the Honduran Criminal Code.

67. The statute of limitations for battery (lesions) depends on the degree of harm caused. The statue of limitation ranges from 4 and one half years to twelve (12) years, in accordance with the Honduran Criminal Code.

68. The statute of limitations for trespass (allanamiento de morada) is one and a half years if the trespass was committed absent violence and four (4) years if the trespass involved violence in accordance with the Honduran Criminal Code.

69. The statute of limitations for wrongful death will depend under which type of crime the action is brought.

a) For homicide, the statute of limitations is thirty (30) years in accordance with the Honduran Criminal Code.

b) For murder, the statute of limitations is generally forty-five (45) years but in cases where the murder is for hire, accompanied by rape, or robbery, there is no statute of limitations in accordance with the Honduran Criminal Code.

c) For negligent homicide, the statute of limitations is generally seven and a half years but is increased to twelve (12) years if the homicide involves drugs or alcohol.

70. The statute of limitations for insults (injurias) is three (3) years in accordance with the Honduran Criminal Code.

71. The statute of limitations for criminal offenses starts to run on the day the crime was committed and if the crime is of continuous nature, from the day of the last criminal action. The statute of limitations is interrupted when there is a criminal action brought against a defendant, and will continue to run if the prosecution is suspended for any reason.

B. Statute of Limitations for the Civil Causes of Action

72. The statute of limitations for a civil negligence action is ten (10) years in accordance with the Honduran Civil Code.

73. The statute of limitation for a cause of action for negligent infliction of emotional distress brought in civil court is ten (10) years, in accordance with the Honduran Civil Code.

74. The statute of limitations for a cause of action for unjust enrichment under Article 114 of the Criminal Code brought in civil court would be (10) years in accordance with the civil code.[8]

75. The statute of limitations for civil actions starts to run on the day of the event that caused the liability and is interrupted by (i) a civil claim brought in court, (ii) any request for payment (in payment obligations), or (iii) any recognition of the amounts owed (in payment obligations).

IX. Conclusions on Viability of the Claims

76. It is my opinion that even if the Plaintiffs' allegations were taken to be true, their claims against IFC AMC would fail under Honduran Law. For example, the lack of relationship and duty on the part of IFC AMC to the Plaintiffs and the lack of causation make it very improbable that a Honduran court would enter judgment in favor of the Plaintiffs and against IFC AMC.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 16th day of February 2018 in Tegucigalpa, Honduras

[8] Please note that even if the cause of action arises from the criminal code, liability is civil in nature and thus subject to civil law.

Exhibit C

→ ANNUAL REPORT 2015

European Space Agency

→ ANNUAL REPORT 2015 SCIENCE & ROBOTIC EXPLORATION EARTH OBSERVATION TELECOMMUNICATIONS & INTEGRATED APPLICATIONS
GALILEO & NAVIGATION-RELATED ACTIVITIES LAUNCHERS HUMAN SPACEFLIGHT & OPERATIONS TECHNICAL & QUALITY MANAGEMENT HUMAN
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esa

→ ANNUAL REPORT 2015

European Space Agency

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→ FOREWORD

The 'wind of change' is blowing and 2015 can with justification be seen as the starting point of a new era. For ESA, coming as it does right in the middle of two Council meetings at ministerial level, 2015 was a year of consolidation, transition and restructuring.

Space is evolving from being the privilege of the governments of a few spacefaring nations to a situation in which we are seeing increased engagement from governments around the world as well as the emergence of private actors. Space 4.0 represents the evolution of the space sector towards a new era in space, characterised by this new playing field. ESA has already started to enter this new phase in which space becomes an everyday business and in which interaction with society, the commercialisation of space, resulting new roles for industry and close, cooperative relations with the European Commission all play an important role. It will be a core task for Jan Woerner, who took up duty as ESA Director General on 1 July, to follow this path and streamline the Agency for this 'wind of change'.

One first step in this direction was the setting up of a new senior management team. At an extraordinary meeting of the ESA Council held on 21 November, Council approved the Director General's proposal for the future senior management team of ESA, including the new 'team of teams' structure and also those chosen to fill eight Director posts. As Co-Council Chairs we take pride in this achievement since we put very considerable effort into the selection of these eight Directors and wish the new management team all the best for the upcoming challenges.

In addition, major new strides were made in the construction of Europe's space infrastructure. Galileo satellites 7 to 10 (FM 03 to 06) were launched and Sentinel-2A, a key contribution to Europe's Earth observation satellite system, was placed in orbit. The contractual basis for the development of the Ariane 6 new-generation launcher, its launch base and the Vega C evolution of the current ESA small launcher has been put in place. These contracts will allow the development of a family of European launchers that will be highly competitive in the world market and provide the assurance of autonomous access to space to ESA Member States at competitive prices. New Member States and Cooperating States have been added and, with the inauguration of the Roy Gibson Building at ECSAT, the flags of ESA's Member States have been raised for the first time at the Agency's first centre in the UK.

For the time being, we are looking forward to the Council meeting at ministerial level on 1–2 December 2016 in Lucerne. With the number of Member States now standing at 22 and fresh with challenges at hand, ESA's new strategic role within Space 4.0 is set to be defined. At this stage, the call must again go out for solidarity among Member States. This crucial meeting will be successful if, indeed when, not only the Member States but also Cooperating States and observers show the cohesion and solidarity they displayed in Luxembourg at the last Ministerial Council.

→ YEAR IN REVIEW

2015 can be seen as a year of transition. After 2014, a year of truly exceptional achievements and landmark decisions which also saw ESA celebrate 50 years of European cooperation in space, the present year could at first appear to have been comparatively quiet. However, this does not mean that it was unimportant. The opposite is clearly the case.

On 30 June, Jean-Jacques Dordain's term of office as ESA Director General came to a close. This makes him ESA's longest-serving DG, having led the Agency since July 2003. He can look back on a great many outstanding achievements and, as his successor, I thank him warmly and pay tribute to him.

A number of missions linked to the International Space Station (ISS) were carried out. On 14 February, the last ATV, *Georges Lemaître*, undocked and manoeuvred into a safe descent trajectory. ESA's fifth automated cargo ferry completed its mission to the International Space Station on 15 February when it reentered the atmosphere and burned up safely over an uninhabited area of the southern Pacific Ocean. These vehicles have served to demonstrate European mastery of automated docking, a technology vital to further space exploration. On 11 June, ESA astronaut Samantha Cristoforetti landed safely on the Kazakh steppes after a three-hour ride in her Soyuz spacecraft. With 199 days on board the ISS on her Futura mission, she set new records for the longest single period spent in space by an ESA astronaut and by a female astronaut more generally. Denmark's first astronaut, Andreas Mogensen, landed safely on 12 September after a busy ten-day mission. Last but not least, Tim Peake started his six-month Principia mission on 15 December. Highlights of his scientific roster will include growing crystals and blood vessels in space, simulating atomic structures and charting areas in the brain as they adapt to stressful situations.

On 11 February, ESA's Intermediate eXperimental Vehicle executed a flawless reentry and splashed down in the Pacific Ocean. As it descended, the 5 m-long, 2 tonne craft performed manoeuvres enabling it to decelerate from hypersonic to supersonic speed. The entry speed created the same conditions as those for a vehicle returning from low Earth orbit. This mastering of reentry will open up a new chapter for ESA. Such a capability is a cornerstone for reusable launcher stages, sample return from other planets and crew return from space, as well as for future Earth observation, microgravity research, satellite servicing and disposal missions.

ESA's LISA Pathfinder lifted off on 3 December on a Vega rocket from Europe's Spaceport in Kourou, French Guiana, on a mission to demonstrate technology for observing gravitational waves from space. Gravitational waves are ripples in the fabric of space-time, predicted exactly a century ago by Albert Einstein's General Theory of Relativity, published on 2 December 1915.

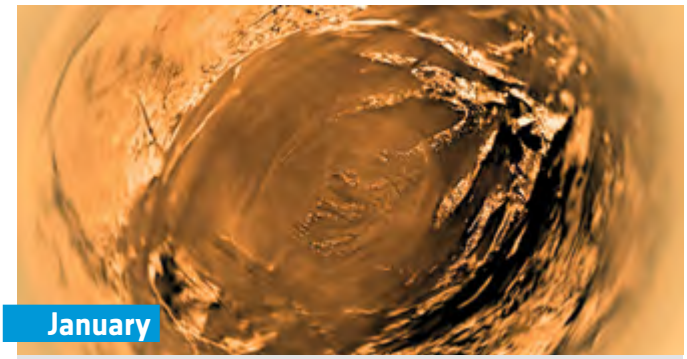
Speaking of space missions, on 16 January, the Beagle-2 lander was found in images taken by a NASA orbiter at the Red Planet. The lander is seen partially deployed on the surface, showing that the entry, descent and landing sequence worked and that it did indeed land successfully on Mars on Christmas Day 2003. On 14 June, Rosetta's lander Philae woke up after seven months in hibernation on the surface of Comet 67P/Churyumov-Gerasimenko.

Space applications were also well represented throughout the year. The pace of deployment of Europe's own satellite navigation system, Galileo, continued to increase. With the launch of Galileo 11 and 12 (FM 08 and 09) on 17 December, the number of satellites in space had doubled in nine months. The other EU-led flagship programme, Copernicus, evolved in similar fashion. The ESA-developed satellite Sentinel-2A was launched on 23 June, adding a high-resolution optical imaging capability to the European Union's Copernicus environmental monitoring system.

A number of new states joined ESA. With the accession of Estonia and Hungary as 21st and 22nd ESA Member States respectively, and the signature of the European Cooperating State (ECS) Agreements by Slovakia (becoming the ninth Cooperating State) and Bulgaria (tenth Cooperating State), the ESA 'family' has been growing and I feel pride that our Agency continues to prove attractive to European states. Large European projects, in particular, can be a means of developing a sense of pride in Europe and its achievements, and thus contribute to the emergence of a strong European spirit and identity. In 2015, as in previous years, we did our utmost to live up to this responsibility.

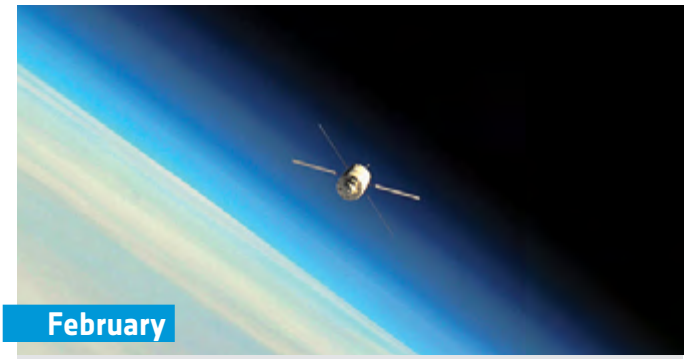
Jan Woerner
Director General

→ HIGHLIGHTS OF 2015



January

15 – Tenth anniversary of Huygens' landing on Saturn's moon, Titan
16 – Beagle-2 found on Mars, having been lost since its release from Mars Express on 25 December 2003



February

11 – Launch of IXV with Vega. It flew a flawless reentry mission and splashed down in the Pacific Ocean
14 – ATV-5 undocked from the ISS and then reentered the atmosphere, marking the operational end of the programme
16 – European Cooperating State Agreement signed between ESA and Slovakia

March

17 – In collaboration with ESA, REXUS-17/18 sounding rockets launched from the Esrange Space Centre with experiments from the UK, Italy, Sweden and Hungary
27 – Seventh and eighth Galileo satellites launched on a Soyuz from Kourou

April

8 – European Cooperating State Agreement signed between ESA and Bulgaria
24 – 25th anniversary of the launch of the NASA/ESA Hubble Space Telescope

May

27 – An Ariane 5 ECA launcher placed two satellites in orbit (DirectTV-15 and Sky México-1)

June

11 – Samantha Cristoforetti returned to Earth. With 199 days on the ISS, she set a new record for the longest single period spent in space by an ESA astronaut
14 – Rosetta reestablished contact with the Philae lander and continued to acquire high-quality science data from Comet 67P
23 – ESA-developed Sentinel-2A launched on a Vega rocket

July

1 – Jan Woerner took up office as ESA's Director General
31 – Inauguration of the Roy Gibson Building at ECSAT in Harwell, UK

August

12 – ESA signed contracts for the development of Ariane 6 (with CNES) its launch base for a maiden flight in 2020 (with CNES) and for Vega-C for its 2018 debut (with ELV)

September

1 – Estonia became ESA's 21st Member State
11 – Ninth and tenth Galileo satellites (FM 05 and 06) launched on a Soyuz 2.1b launcher from Kourou
12 – Andreas Mogensen completed his 10-day 'iriss' mission

October

5 – Agreement signed between ESA and Eumetsat for the continued development of the MetOp Second Generation satellites

November

4 – Hungary became ESA's 22nd Member State
30 – Informal 'Space Council' attended by EU and ESA Ministers in charge of space

December

3 – LISA Pathfinder spacecraft launched from Kourou on a Vega rocket
4 – ESA Director General visited the Paris 2015 UN Conference on Climate Change (COP21)
15 – ESA astronaut Tim Peake lifted off on his six-month Principia mission to the ISS

→ DIRECTORS

Jan Woerner
Director General

Franco Ongaro
Director of Technical & Quality Management

Volker Liebig
Director of Earth Observation

Alvaro Giménez Cañete
Director of Science & Robotic Exploration

Thomas Reiter
Director of Human Spaceflight & Operations

Didier Faivre
Director of Galileo Programme & Navigation-related Activities

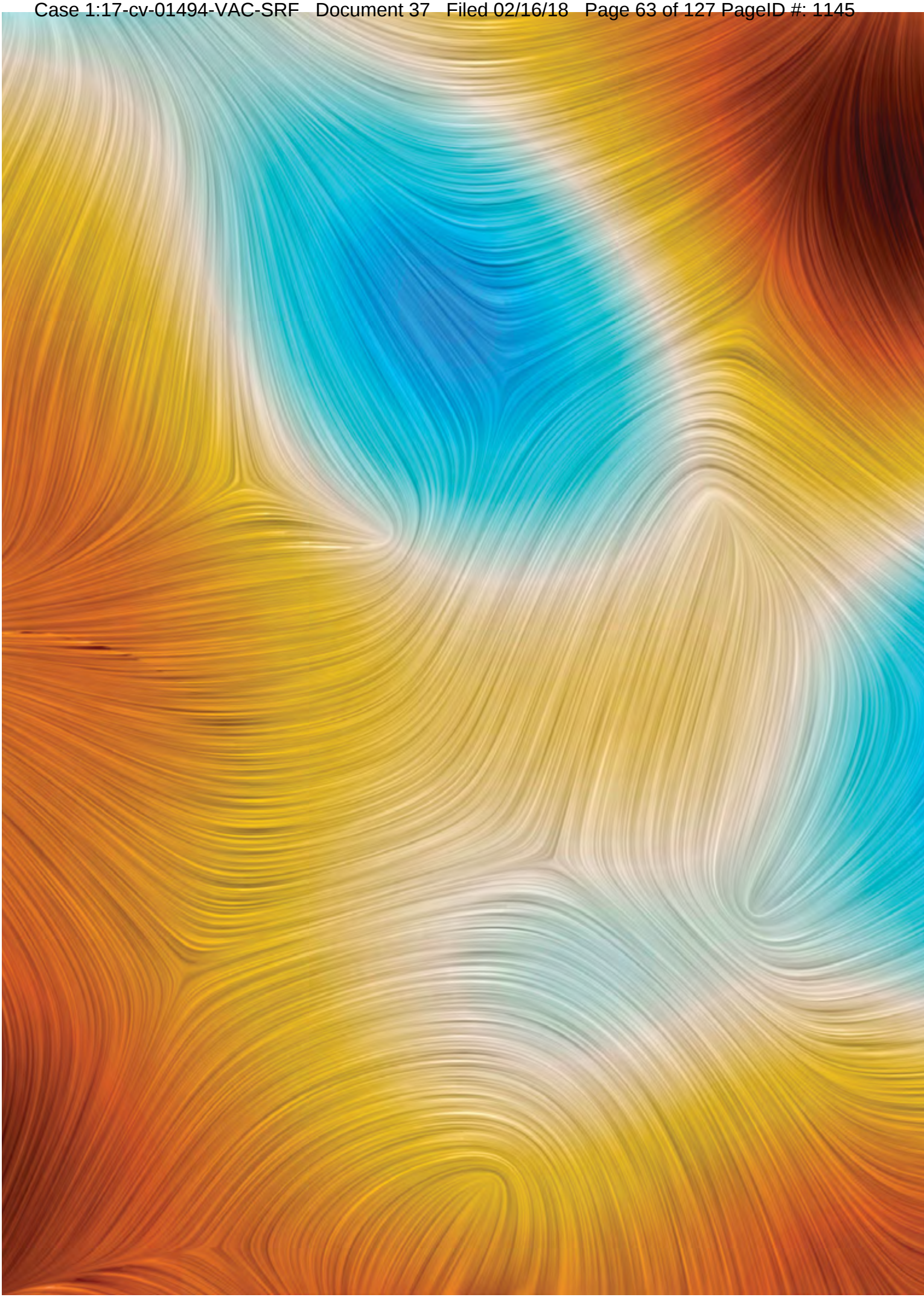
Magali Vaissiere
Director of Telecommunications & Integrated Applications

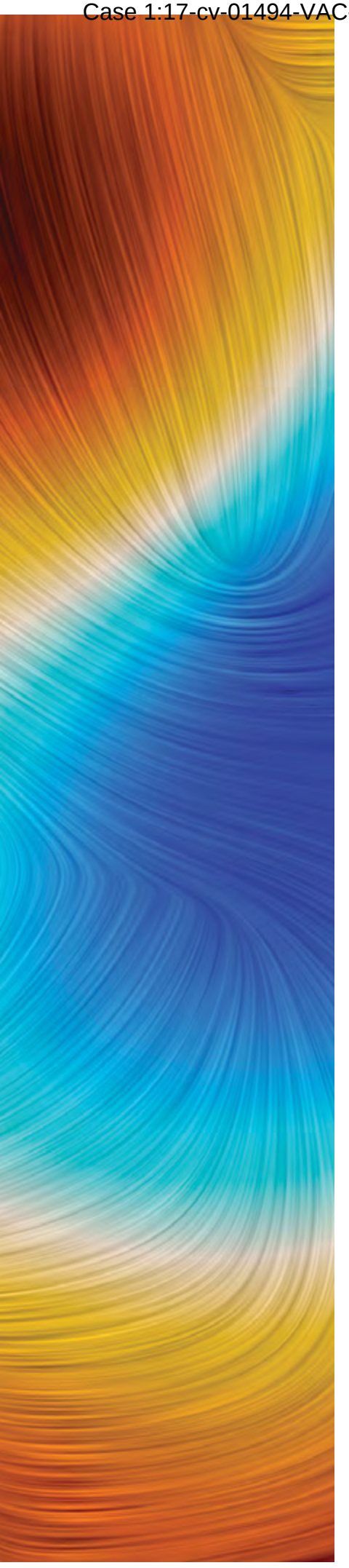
Gaele Winters
Director of Launchers

Eric Morel de Westgaver
Director of Procurement, Financial Operations & Legal Affairs

Hans Georg Mockel
Director of Human Resources, Facility Management & Informatics

Giuseppe Morsillo
Director of ESA Policies, Planning & Control





Polarisation of the Cosmic Microwave Background *as detected by ESA's Planck satellite (ESA/Planck Collaboration)*

Cosmic Vision

Following a call issued in August 2014, three concepts were selected in June 2015 for study for the M4 launch opportunity in 2025–26. ARIEL would investigate the atmospheres of exoplanets by visual/near-infrared photometry and spectroscopy of transiting systems; THOR would investigate the energy balance and particle acceleration in the solar wind; and XIPE would perform high-sensitivity observations of X-ray polarisation from a variety of astrophysical objects. One mission will be selected for further study in mid-2017.

ESA and the Chinese Academy of Sciences issued a joint call for a small mission in January 2015, resulting in the selection in November of the SMILE mission, to be implemented jointly aiming for launch in 2021. SMILE will investigate the interaction between Earth's magnetosphere and the supersonic solar wind. Adoption is planned for 2017.

The Phase-B1 activities for the M3 mission PLATO, designed to detect exoplanets via transits, progressed through 2015 with completion expected in late 2016.

Phase-A has started for the L2 mission Athena, an observatory to study the hot and energetic Universe. Technology activities have commenced covering critical elements of the mission (including X-ray optics, payload cryogenic chain, and mechanisms).

Missions in operation

Missions in operation at the end of 2015 included astrophysical observatories and surveyors (Gaia, Integral, XMM-Newton, and Hubble Space Telescope with NASA), *in situ* missions to planets and minor bodies in the Solar System (Mars Express, Rosetta, and Cassini–Huygens with NASA), and spacecraft studying the Sun (Proba-2, SOHO, and IRIS with NASA, Hinode with JAXA) and the Sun/Earth connection (Cluster). Hubble and SOHO marked 25 and 20 years of science operations, respectively. Post-operational data calibration and processing activities are also ongoing for Herschel, Planck and Venus Express.

The Rosetta spacecraft continued to accompany Comet 67P/Churyumov-Gerasimenko throughout 2015, passing perihelion in August and then continuing as the comet began its journey back towards the outer Solar System. Extensive scientific results on the physical, chemical and electrical properties of the comet continue to be returned. Although the Philae lander made brief contact with Rosetta on several occasions in mid-2015, it was not possible to restart its science observations. Initial planning took place to investigate an end-of-mission scenario that would involve a controlled impact of the orbiter on the comet in September 2016.

Comet 67P *in January 2015 as seen by Rosetta's NAVCAM*

The Gaia mission continued its survey of the distances, motions, and characteristics of stars in the Milky Way. Important progress was made in dealing with a number of issues that complicate the data processing, including variations in the so-called 'basic angle', outgassing, and scattered light. Things remained on schedule for a first Gaia data release in summer 2016.

The first Planck all-sky polarisation maps were released in 2015 providing an entirely new view of the sky. They provide a unique probe of the thermal history of the Universe during the time when the first stars and galaxies formed.

Herschel has been used to investigate a number of unusually bright Planck sources – demonstrating the synergy between these missions – and has shown that the majority are linked to intense star formation in galaxies in what are commonly interpreted as proto-clusters.

XMM-Newton has contributed to our understanding of exoplanet systems by observing intense X-ray emission during the periastron passage of a Jupiter-mass planet around the star HD 17156. The result is evidence for a strong magnetic star-planet interaction either via magnetic reconnection or accretion onto the star.

Mars Express continues to make major findings after more than a decade of observations. Digital elevation models provided by the High Resolution Stereo Camera have enabled the quantification of geological processes such as effusion rates of lava flows, tectonic deformation, discharge of water in channels, formation timescales of deltas and the geometry of sedimentary deposits.

Venus's southern polar vortex has been extensively studied by Venus Express, showing that its 'eye' changes shape on a day-to-day basis and that the rotation rate varies, but has an average period of about 2.5 days.

Science archives

The ESA science archives have become a fundamental tool and reference source for space scientists worldwide providing data from over 15 current and past science missions. The archives team have focused on developing robust web applications allowing scientists worldwide to openly and seamlessly select, compare, and retrieve science-ready data from space missions in astronomy and Solar System science.

Research activities

Research areas in 2015 included Earth's magnetosphere, meteor showers, the terrestrial planets, the formation and evolution of planets, stars and galaxies, fundamental physics and cosmology.

One research project addresses the electrical environment of two magnetospheric missions: ESA's Cluster and NASA's Magnetospheric Multiscale mission. Both missions have instruments that emit indium ions to keep the spacecraft potentials close to zero. Simulations are being run for various plasma conditions and compared with real electric and plasma data measured at the spacecraft to understand the electrical fields, and to provide a better interpretation of the scientific data.

Projects under definition & under development

LISA Pathfinder

Launch: December 2015

LISA Pathfinder was launched on a Vega vehicle from Kourou on 3 December 2015. Following its insertion into a Sun/Earth L1 orbit, the spacecraft was commissioned and has been operating flawlessly. In the meantime, it has demonstrated some of the key technologies needed to detect gravitational waves: the overall performance of the drag-free system exceeds the requirements set for this demonstration mission by a significant margin, approaching the performance required of the planned L3 gravitational wave observatory mission.

BepiColombo

Launch: April 2018

BepiColombo will make a detailed study of Mercury, the least explored planet in the inner Solar System. The environmental and functional testing of the flight models of both ESA-provided modules, the Mercury Planetary Orbiter (MPO) and the Mercury Transfer Module (MTM), are ongoing at ESTEC. The JAXA-provided Mercury Magnetospheric Orbiter (MMO) has also been delivered to ESA.

The flight model of the BepiColombo *Mercury Magnetospheric Orbiter (MMO) at ESTEC*

ExoMars
Launch: 2016 and 2020

ExoMars comprises two separate missions under an ESA/Roscosmos cooperation agreement, to carry out science from orbit around and from the surface of Mars, and to demonstrate technologies for future exploration missions. The 2016 mission includes a Trace Gas Orbiter (TGO), and an Entry, Descent and Landing Demonstrator Module (EDM). TGO will probe the atmosphere for indicators of biological activity and provide a communications link for future Mars missions. The launch date of the rover mission has been shifted from 2018 to 2020 after a detailed schedule assessment. It will perform sub-surface investigations and search for evidence of life past and present.

Solar Orbiter
Launch: 2018

Solar Orbiter will provide unprecedented close-up and high-latitude observations of the Sun and inner heliosphere. The spacecraft development is progressing, with the system Critical Design Review closure expected in mid-2016.

James Webb Space Telescope (JWST)
Launch: 2018

JWST, under joint development by NASA, ESA and the Canadian Space Agency, is an infrared observatory (with 6.5 m diameter mirror) that will search for light from the first objects that formed in the Universe after the Big Bang, study galaxy evolution and probe the early phases of star and planet formation. Both European instruments (NIRSpec and MIRI) have been through the full series of cryo-vacuum testing of the Integrated Science Instrument Module (ISIM).

CHEOPS
Launch: 2018

CHEOPS is a small spacecraft that will determine the masses and radii of exoplanets, in the super-Earth to Neptune mass range, orbiting bright stars using ultra-high precision photometry and provide targets for future in-depth characterisation. It is on track for a launch as passenger along with a larger satellite in 2018, subject to the availability of a suitable slot.

Euclid
Launch: 2020

Euclid will investigate the nature and origin of dark matter and dark energy. The system and mission Preliminary Design Reviews were completed successfully in 2015. Progress has been made in the development of the detectors for the Near-Infrared Photospectrometer and Visible Imager System instruments.

JUICE
Launch: 2022

The JUICE mission will explore the Jupiter system and its icy satellites, with emphasis on Ganymede, Callisto and Europa. After a two-year tour of the Jupiter system, the spacecraft will enter orbit around Ganymede. Industrial activities began in mid-2015 and development is ongoing.

Integration of last primary mirror segment *on the James Webb Space Telescope (NASA/C. Gunn)*

Robotic exploration

To prepare ESA's post-ExoMars robotic exploration programme, several candidate missions have been studied for a launch opportunity in 2024 or 2026 in the context of the Mars Robotic Exploration Programme (MREP). A Phobos Sample Return (PhSR) mission was judged the most promising candidate to prepare technologies for ESA's contribution to Mars Sample Return as well as to deliver important science. Based on a joint ESA/Roscosmos Concurrent Design Facility study confirming two technically viable and scientifically interesting options for a cooperative PhSR mission, two parallel industrial Phase-A studies were started in 2015. In May, ESA and Roscosmos exchanged letters covering their cooperation on the Phase-A studies. MREP is also developing technologies relevant to PhSR and for future European participation in Mars Sample Return endeavours. International cooperation discussions on Mars Sample Return continued in 2015 in the framework of the International Mars Exploration Working Group, as well as bilaterally with NASA.

PRODEX

PRODEX (Programme de Développement d'Expériences Scientifiques) manages around 200 contracts in its 11 Participating States and, in 2015, started or continued instrument development for ESA science, Earth observation and exploration.

Two ExoMars 2016 instruments (NOMAD, BE; CaSSIS, CH, PL, IT) were delivered in 2015 for integration on the ExoMars TGO.

Phase-C/D development for several Solar Orbiter instruments continued including EUI (BE) and STIX (CH), as well as subsystems of RPW, SPICE, METIS and PAS-SWA, representing 20 contracts in six countries.

Other highlights included completion of the development of the ALTIUS Phase-B1 instrument; a new activity in the Netherlands (AMS) was defined, with a planned start by June 2016; the continued development of the CHEOPS payload at Phase-C/D (CH, BE, AT), as well of ASIM (ISS-DK); initiation of 13 Phase-B activities in six countries for seven instruments on JUICE.

Finally, the Swiss PRODEX contribution to the NASA Insight mission, the SEIS E-BOX (Power, Communication, and Data Acquisition and Processing), was delivered on time and passed tests at NASA's Jet Propulsion Laboratory.

Acquired on 27 June 2015, *just four days after launch, this close-up of France's southern coast was among the first images returned by the Sentinel-2A satellite (Copernicus/ESA)*

Copernicus

Copernicus will provide accurate, timely, easily accessible information to improve management of the environment, understand and mitigate the effects of climate change and ensure civil security. The most significant Copernicus event in 2015 was the launch of Sentinel-2A from Kourou by Vega on 22 June. On the programmatic side, the Copernicus Annual Work Programme 2015 was adopted by the European Commission (EC). ESA delivered the Copernicus Space Component 2016 Annual Work Programme to the EC. A dialogue with the EC was started on the evolution of the Copernicus Space Component.

Sentinel-1

Sentinel-1 is the Copernicus high-resolution radar mission based on two satellites, orbiting 180 degrees apart, designed in response to user requirements issued by the European Commission that ensure continuity of C-Band radar observation, initiated with ERS-1/2 and continued with Envisat ASAR, with much better sensitivity, radiometric quality, frequency of observations and volume of operations. Sentinel-1A, the first spacecraft in the Sentinel-1 mission, has been in operation since October 2014. The second spacecraft, Sentinel-1B, is being readied for a launch in April 2016. Procurement of the recurrent Sentinel-1C and Sentinel-1D satellite models has been initiated under the Copernicus agreement.

Sentinel-2

Sentinel-2 is the optical multispectral Copernicus mission ensuring continuity and further development of the SPOT/Landsat missions. The mission is based on two satellites flying in the same Sun-synchronous orbit with a separation of 180 degrees. Sentinel-2A was launched on 23 June and has been delivering excellent mission performance since the in-orbit commissioning review took place in mid-October. The core products of Sentinel 2A were pre-operationally qualified and access to them was opened for all users on 3 December. Procurement of the recurrent Sentinel-2C and Sentinel-2D satellite models has been initiated under the Copernicus agreement.

Sentinel-3

Sentinel-3 is the Copernicus mission delivering global, frequent, near-real time ocean and land monitoring and providing enhanced continuity with Envisat in these areas. Two operational satellites are envisaged to provide a one-day (land) and two-day (ocean) revisit time. Sentinel-3A completed its environmental test campaign during the first half of 2015, including the thermal vacuum/thermal cycling test and radiated emissions tests. During the summer, the final set of optical instruments was swapped on the satellite, having completed their acceptance testing and ground calibration. Following a penalty mechanical test to demonstrate adequate workmanship status of the

***Sentinel-1B** antenna readied for transport to meet its spacecraft in May 2015 (Airbus D&S/A. Ruttloff)*

***A highlight of 2015 was the launch of Sentinel-2A** from Kourou by Vega on 22 June*

satellite, Sentinel-3A passed the Qualification Acceptance Review and was shipped in November to the launch site (Plesetsk) for a launch in February 2016. In parallel to the Sentinel-3A activities, the integration of the Sentinel-3B platform was completed. Restart of AIT activities is planned later in 2016, awaiting availability of the optical payload. Procurement of the recurrent Sentinel-3C and Sentinel-3D satellite models has been initiated under the Copernicus agreement.

Sentinel-4

Sentinel-4 is the Copernicus mission that will deliver accurate, hourly data supporting air quality monitoring and forecasting over Europe. Sentinel-4 is a high-resolution spectrometer instrument covering the ultraviolet, visible and near-infrared bands in the solar reflectance spectrum. Two identical Sentinel-4 instruments will be flown on two MTG-Sounder (MTG-S) satellites. The industrial contract for Phase-C/D/E1 with prime contractor Airbus Defence & Space (DE) was signed in December.

Sentinel-5

Sentinel-5 is the Copernicus mission providing global data on the composition of the atmosphere. The Sentinel-5 instrument will be embarked on the MetOp-SG satellite A series. The service is focused on air-quality monitoring and composition/climate interaction. Phase-B2 of the project was concluded in December with the completion of the Preliminary Design Review. All Invitations to Tender for the subcontractors were issued and by the end of 2015, more than 80%, in value, had been kicked off. The Phase-C/D proposal, including the activation of the two recurrent Flight Models (FM2 and FM3), has been received from industry and will be negotiated in the first quarter of 2016. The procurement of Sentinel-5B and -5C has been approved by the EC.

Sentinel-5P

The Sentinel-5 Precursor, a single-satellite mission within Copernicus, provides continuity of the atmospheric chemistry mission (OMI on EOS/Aura) in the period up to the entry into service of the Sentinel-5 operational instrument. It is being implemented in cooperation with the Netherlands. The TROPOMI payload Flight Model was delivered in May by the Netherlands Space Office. Following integration with the AstroBus platform, satellite environmental testing was started and the upgrade of the Payload Data Ground Segment (PDGS) to full operational status implemented. The Launcher Final Mission Analysis Review was held.

Sentinel-6 /Jason-CS

The Sentinel-6/Jason-CS mission continues on from the high-precision measurement of ocean topography started with TOPEX/Poseidon in 1992 and carried forward with Jason-1, Jason-2 and Jason-3. On a tide-free orbit, the Jason series also serves as a reference point for polar-orbiting altimeters such as Sentinel-3 and Cryosat-2. There will be two Sentinel-6 satellites, replacing typically with a one-year overlap Jason-3 at the end of its lifetime. Sentinel-6A and -6B should provide continuity of reference altimetry data up to 2030. After the Preliminary Design Review, the project entered Phase-C0, which was concluded in mid-2015 and a Preliminary Authorisation to Proceed covered Phase-C1/D for both the A and B satellites until the end of the year.

With the entry into force of the Eumetsat Jason-CS programme in September and the approval of the Implementing Arrangement in December by the Councils both of ESA and of Eumetsat, the project is now fully funded and the industrial contract rider for both the A and B satellites was set for signature in early 2016. The Sentinel-6A contract was signed with Airbus Defence & Space at the International Symposium on Remote Sensing of Environment (ISRSE) in Berlin. By the end of 2015, more than 80% of the Best Practices elements were procured. Stepwise development of the new Poseidon-4 altimeter fully digital architecture is proceeding to plan.

Ground Segment

During its initial operations phase, the Coordinated Data System for the Sentinels has been operationally serving some 70 Copernicus services continuously and also responding to the EC's data warehouse requirements. The ESA Sentinel data access architecture assures that all Sentinel core products are accessible for all users online. ESA delivers all Sentinel products on a 24/7 basis on a near-real time (three hours from sensing) as well as a non-time critical (24 hours from sensing)

Sentinel-3A satellite *in Cannes, France, on 14 October 2015, before being packed up and shipped to Russia for launch*

basis. More than 35 000 self-registered users have access to more than 600 000 products and have downloaded more than five million products. The ESA Sentinel Data Hub provides an open source web interface and users can set their own scripts to retrieve, filter and download products automatically. In addition, the Sentinel Toolbox is also available online as open source software. Data access is evolving quickly in design and capacity in order to cope with rapidly increasing user needs for easy Sentinel data access.

Earth Explorer missions launched

Swarm

The aim of the three-satellite Swarm mission is to provide the best ever survey of the geomagnetic field and its temporal evolution. It is expected to lead to new insights into the Earth system by improving our understanding of Earth's interior and its effect on the magnetosphere, the vast region around Earth where electrodynamic processes are influenced by Earth's magnetic field. Since the end of their commissioning phase in April 2014, the three Swarm satellites have been providing remarkable data through the on-ground data systems, which are fully operational in terms of production and data quality analysis, including all geomagnetic field modelling efforts involving a 'scientist-in-the-loop'. The main technical and scientific issues are related to the absolute scalar magnetometer situation (loss of both nominal and redundant unit on Charlie satellite) and the limited availability of high-quality accelerometer data. The constellation and its operations are otherwise in perfect shape.

CryoSat

CryoSat is Europe's ice mission, providing multi-year elevation data at latitudes never before reached by a satellite altimeter. It measures thickness changes in the ice sheets that overlay Greenland and Antarctica as well as in marine ice floating in the polar oceans. The overall performance of the CryoSat mission remained excellent in 2015, both in terms of operations and science delivery, extremely relevant in the context of climate change impact on polar areas. CryoSat released its six-year sea-ice volume of the Arctic, an important input to the cryosphere community for a better understanding of the evolution of the Arctic area.

SMOS

SMOS provides the observation of two key variables of the Earth system, namely the soil moisture content over land surfaces and the amount of salt dissolved in the ocean. SMOS is a cooperative project between ESA, CNES and CDTI (ES). The excellent operational performance of the SMOS satellite and ground systems continued in 2015. Soil moisture information is now provided in near-real time, further supporting operational applications. Specific efforts made it possible to improve substantially the quality of the sea-surface salinity products delivered by the SMOS mission. The provision by SMOS of some information on sea-ice thickness complements the information obtained from CryoSat, demonstrating the increasing synergy between Earth Explorer missions.

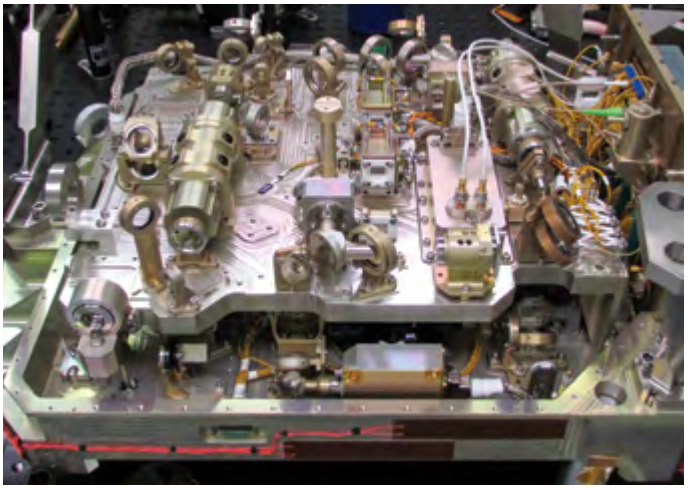
GOCE

GOCE was dedicated to measuring Earth's gravity field and modelling the geoid with unprecedented accuracy and spatial resolution. It advanced our knowledge of ocean circulation, which plays a crucial role in energy exchanges around the globe, sea-level change and Earth's interior processes. The extended analysis of the data gathered by the GOCE satellite during its four years of operations (2009–13) confirms that all mission requirements have been met, with margins. In 2015, the Phase-F activities (post-satellite operations) focused on supporting the widest possible scientific exploitation of the mission products.

Future Earth Explorer missions

ADM-Aeolus

ADM-Aeolus will provide the first ever measurements of vertical wind profiles from space. These data are expected to advance numerical weather prediction substantially, especially when applied to extreme weather events. Aeolus saw important progress in 2015 related to completion and delivery of the second laser transmitter, completion of the Aladin instrument build status and preparation for final instrument tests. For the other elements of the mission, 2015 was dedicated to recovery from a long-term hibernation period. On the satellite side, the platform was 'woken up' and the flight software upgraded to reflect the latest operational characteristics of Aladin and the satellite. The In-situ Cleanliness Subsystem was completed and verified for correct performance. The Flight Operations Segment and Payload Data Ground Segment development teams were reactivated in preparation for the Ground Segment Overall Validation and System Validation tests with the satellite. The technical interfaces for the Vega launch service provision were consolidated. The target launch readiness of the satellite is mid-2017.



The ADM-Aeolus satellite's second Aladin laser *prior to closure showing the complexity of the 80 optical components (Seles-ES)*

EarthCARE

EarthCARE will carry a payload of four instruments that will operate synergistically with the aim of providing a better understanding of clouds and aerosols and their impact on Earth's climatology. It is a joint mission in collaboration with JAXA (Japan). The EarthCARE industrial Phase-C continued in 2015 with the integration of all avionics and electrical units of the base platform. The production and integration of the three optical instruments progressed in Europe with the integration of optical heads of both the Multispectral Imager and Broadband Radiometer, which are nearing completion. A major step was achieved with the complex ultraviolet lidar instrument with the final assembly and initial tests of the Protoflight Flight Model (PFM) transmitter. In Japan, integration of the PFM Cloud Profiling Radar was completed and initial tests of the assembled instrument initiated by JAXA.

Biomass

Biomass will provide measurements of forest biomass and forest height to help us understand the state of Earth's forests, their evolution over time and advance our understanding of the carbon cycle. The mission will be implemented through a full polarimetric P-band Synthetic Aperture Radar (SAR) flown on a single satellite. Following a positive recommendation by ESAC, the mission was confirmed by the Earth Observation Programme Board at the beginning of 2015. The competition for building the satellite was run during 2015 and won by a consortium led by Airbus Defence & Space (UK).

Earth Explorer 8

The 8th Earth Explorer Phase-A/B1 activities were completed in early 2015 for the two candidate Earth Explorer 8 opportunity mission candidates, CarbonSat and FLEX. Intermediate System Requirements Reviews were completed to assess the technical maturity of the system designs of the FLEX and CarbonSat missions from the respective parallel activities of two industrial consortia. The objective of CarbonSat is to quantify sources and sinks of carbon dioxide and methane accurately by measuring their distribution in the atmosphere, while the aim of FLEX is to quantify photosynthetic activity and plant stress by mapping vegetation fluorescence. In June, two detailed Mission Selection Reports were published and were provided as the basis for a User Consultation Meeting, held in Poland in September. The consultation with a broad cross-section of scientific users provided a basis for ESA's Earth Science Advisory Committee to make a recommendation to the Director of Earth Observation Programmes for selection of the FLEX mission. At the Earth Observation Programme Board in November, a proposal for full implementation of the FLEX mission was approved.

Earth Explorer 9 call

After discussion and approval by the Earth Observation Envelope Programme (EOEP) Participating States, ESA published a Call for Proposals for the 9th Earth Explorer Mission on 23 November. Proposals are due in June 2016 and two candidate missions will be selected to enter Phase-A.

Meteorological missions

MetOp

The three MetOp polar-orbiting meteorological satellites, developed by ESA, constitute the space segment of the Eumetsat Polar System. MetOp-B has been providing the primary meteorological observations from polar orbit since April 2013. In parallel, MetOp-A continues to provide normal operations after more than eight years in orbit. MetOp-C is currently in storage, subject to annual maintenance, with a planned launch in 2018.

MetOp-SG

The second generation of MetOp satellites (MetOp-SG) are planned to continue and enhance the observations provided by the current, first generation of MetOp satellites and will constitute the space segment of the second-generation Eumetsat Polar System. MetOp-SG will consist of two series of satellites (A and B) and will provide the operational meteorological observations from polar orbit for the period from the early 2020s to mid-2040s. The system-level Preliminary Design Review was completed in November. This was a very large review covering two series of satellites and six Contractor Provided Item instruments: Microwave Sounder, Microwave Imager, Ice Cloud Imager, Multi-viewing Multi-channel Multi-polarisation Imager, Radio Occultation sounder, and Scatterometer. Very good progress has been made on the build-up of the industrial consortia in accordance with ESA's Code of Best Practices for the selection of subcontractors. The overall schedule remains unchanged with a launch of the first A satellite planned in June 2021, followed by the first B satellite in December 2022.

MSG

Meteosat Second Generation (MSG) is a continuation and substantial enhancement of the previous Meteosat system. It consists of a series of four geostationary meteorological satellites, to be operated until at least 2021, providing continuous imagery of Earth's atmosphere, clouds and surface. The performance of MSG-1 (Meteosat-8), MSG-2 (Meteosat-9) and MSG-3 (Meteosat-10) is nominal after 13, 10 and three years in orbit, respectively. MSG-1 is the backup for the operational services provided by MSG-2 and MSG-3. MSG-4 (Meteosat-11) was launched on 15 July and placed in on-orbit storage after successful commissioning. It will ultimately bridge the gap between MSG-3 (Meteosat-10) and the first Meteosat Third Generation satellites.

MTG

The Meteosat Third Generation (MTG) satellites will ensure continuity of operational meteorological and climate data from geostationary orbit after completion of the ongoing

MSG missions. MTG-I (Imager) provides enhanced visible and near-infrared imagery and a new Lightning Imager. MTG-S (Sounder) provides a new infrared sounding capability from geostationary orbit and will also accommodate the Sentinel-4 UVN spectrometer. Substantial progress was made within the MTG Programme in 2015. The Preliminary Design Reviews at all levels were completed and the Critical Design Review process is well advanced, with many equipment-level reviews already completed. Overall, the satellites (MTG-I and MTG-S) are largely completed with few residual issues to be addressed. The predicted performances for both MTG-I and MTG-S missions remain highly compliant with requirements. During the year the significant challenges involved in the MTG development activities became increasingly evident and have resulted in a revision of the overall programme schedule, with the Flight Acceptance Review for the protoflight satellites now predicted in the second quarter of 2020 and last quarter of 2021 for MTG-I and MTG-S respectively. This remains consistent with Eumetsat needs thanks to the flawless launch and commissioning of MSG-4 (Meteosat-11).

The first image returned from MSG-4 *(Meteosat-11), taken on 4 August 2015 (Eumetsat)*

Other missions

Proba-V

The Proba-V small satellite mission supplies vegetation imagery for applications such as climate impact assessments, water resource management, agricultural monitoring and food security estimates. Proba-V was launched in May 2013. Throughout 2015, Proba-V data were provided to an increasing number of users interested in the monitoring of global vegetation and its changes over time, including the Copernicus Global Land Service.

SAOCOM-CS

SAOCOM–1b is an Argentinian (CONAE) polarimetric L-band SAR mission expected to launch in the 2017–18 timeframe. ESA is developing a small companion satellite to fly in convoy with SAOCOM-1b and provide the first ever L-band bistatic SAR measurements from space, and support new applications such as 3D boreal forest and surface deformation maps as well as demonstrating the benefits of international cooperation on missions. In 2015, Phase-A/B1 SAOCOM-CS (Companion Satellite) was carried out, leading to the approval of Phase-B2 and the ITT for the full procurement of the satellite by Member States in February 2016.

Apart from monitoring vegetation growth over Earth, *the Proba-V minisatellite has recorded over 25 million positions from more than 15 000 separate aircraft. This is a technical world-first, demonstrating the feasibility of follow-on orbital constellations now being readied for operational aircraft monitoring*

Seosat/Ingenio

Seosat/Ingenio is a Spanish national mission developed by ESA on behalf of Spain's centre for the development of industrial technology, CDTI. It is planned to provide metric resolution multi-spectral land optical images. The main applications are related to cartography, land use, land cover, urban land planning, agriculture and forestry mapping, environmental monitoring, water management, risk management and security. Seosat/Ingenio is meant to provide services to Spanish and European users in the framework of Copernicus and GEOSS. Cooperation on Seosat/Ingenio between ESA and Spain continued in 2015. Development of the satellite and of the ground segment has progressed. The primary payload Flight Model integration resumed after implementing some local design improvements. The platform Flight Model is integrated and awaiting the primary payload delivery expected for the end of 2017. The ground segment has performed the Critical Design Review and is currently being integrated. Currently, Seosat/Ingenio is expected to be ready for launch by the end of 2018.

Other activities

EO Strategy

The ESA Earth Observation Strategy 2040 was approved by the Earth Observation Programme Board in September. The new strategy offers a vision for the future, accounts for new boundary conditions, sketches a unique role for ESA and integrates the Earth Observation Science Strategy and Ground Segment Strategy.

Earthnet

Through the Earthnet programme, ESA enables user access to Earth observation data from around 30 different non-ESA missions and instruments (Third Party Missions). This includes, for example, Landsat-8 operations in Europe or the Spot 5 Take 5 experiment from April to September aimed at simulating the

five-day revisit scheme of the Sentinel-2 mission, before the final de-orbiting of the Spot-5 satellite by the French space agency CNES. The Earthnet programme has also ensured ESA has a presence in GEO and CEOS international bodies.

Heritage Data programme

The Heritage Data programme (i.e. Long Term Data Preservation) continued to ensure that no historical Earth observation data was lost in 2015. This includes historical Earth observation third-party data from the 1980s and 1990s (for example, from the first Landsat missions). The limited programme budget was used for the gradual transcription from tape onto online media and to improve heritage data discoverability and accessibility for users.

Climate Change Initiative

The programme progressed according to plan in 2015. All projects have started Phase-2 of their Essential Climate Variable (ECV) production schedule. In parallel, two new activities have started that facilitate access to, and use of, the ECV data products: the Climate Change Initiative (CCI) Open Data Portal and the CCI Tool Box. In addition, 13 grants have been awarded to early career scientists for two-year projects that involve novel use and exploitation of ECV products. Eight of the ECVs within the CCI programme have been included in the Copernicus Climate Change Service call, giving strong opportunities for these projects to be incorporated in an operational context.

Earth Observation Data Exploitation

The Support To Science Element continued to be a source of major scientific highlights, such as the first digital elevation model (DEM) of Greenland using the swath processing of Cryosat SarIn data, the use of GOCE gravity gradients to obtain information on hydrocarbon maturity or a new more robust estimate of the ice-mass balance in the Antarctic peninsula.

Within the Scientific Exploitation of Operational Missions (SEOM) Element, the first ESA 'massive open online course' on climate had over 16 000 participants, the SNAP open source scientific toolboxes had been downloaded 35 000 times from 190 countries after 10 months, and the innovative Ocean Virtual Laboratory was opened. Science user consultations have been continuing to prepare for EOEP 5 including the first ESA Earth Observation Open Science 2.0 conference.

The Data User Element continued its engagement with user communities, promoting and demonstrating the benefit of Earth observation. Organising thematic workshops and participating in dedicated user conferences, including UNFCCC COP21 in Paris strengthened these links and maintained long-term relations with the respective user communities and opened avenues to new ones. Within the Value Adding Element (VAE), the fourth survey of the European Earth observation downstream services industry was published by the European Association of Remote Sensing Companies (EARSC). The survey shows that this industry sector has grown 20% since 2012 to an estimated annual total revenue for 2014 of €910 million, with the public sector being the largest customer base (72% of revenues). Collaboration with the Asian Development Bank started with support for 11 bank projects, and ESA signed a five-year Memorandum of Intent with the World Bank to further strengthen cooperation, at COP21 in Paris, in December.

Campaigns

In 2015, ESA airborne campaigns continued to play an essential role in preparing future Earth observation satellite missions and verifying both the performance and accuracy of data and products from ESA satellite missions already in orbit. A highlight of 2015 was the AfriSAR airborne campaign in Gabon, which delivered the first African tropical forest biomass maps using P- and L-band Synthetic Aperture Radar measurements similar to the future Biomass and SAOCOM-CS Earth observation missions. The AfriSAR results are considered essential to the mission designs and to preparing the user community to make best use of Biomass and SAOCOM-CS.

CEOS/GEO

The Group on Earth Observations (GEO) and the Committee on Earth Observation Satellites (CEOS) continued to fulfil their role as cornerstones of international cooperation activities. Throughout 2015, CEOS continued to be one of the main contributors to international initiatives such as the GEO Global Forest Observation Initiative (GFOI), supporting the UN

esrin

The ESRIN anti-seismic consolidation project has been completed for buildings 3, 6, 7 and 10. To improve access to ESRIN, construction works for a second bridge started. This is part of the Host Agreement, and funds are provided by the Italian space agency ASI. The canteen refurbishment work was completed and the new lunch room was opened after three years of phased works without any break in service. The number of visitors to ESRIN in 2015 was around 80 000.

At the beginning of 2015, ESRIN's Energy Management System was certified according to ISO 50001:2011. Regarding environmental performance in 2015, ESRIN reduced its overall energy use by 7% from the baseline year of 2007, and by 25% from 2010. Moreover, ESRIN CO_2 emissions were down 28% from the baseline year in 2015, with ESRIN environmental improvement initiatives saving a total of 3180 tonnes of CO_2 emissions from being released into the atmosphere.

Further to the exchange of *notes verbales* between the Italian Ministry of Foreign Affairs and ESA concerning some clarifications to the signed text of the Host Agreement, the draft law was submitted by the ESA Executive to the Italian Senate in July. In September, the draft law was assigned to the III Commission (Foreign Affairs) and the opinion of 14 other commissions was required. By the end of the year, two commissions had given their favourable opinion.

Framework Convention on Climate Change and the GEO Global Agriculture Monitoring (GEOGLAM) initiated by the G20.

The year saw the renegotiation of several major treaties related to disaster management (third UN World Conference on Disaster Risk Reduction, Sendai, Japan); to the UN Sustainable Development Goals (UN Sustainable Development Summit 2015, New York); and to climate change (21st Conference of the Parties, COP21, Paris, France). For the first time in 20 years, several references to 'remote sensing' were explicitly inserted in the 15-year UN plan of action adopted in Sendai. As main coordinator of space matters for GEO, CEOS played a key role in the preparation of the GEO Strategic Plan 2016–25, adopted by the 102 GEO members during the latest 2015 GEO Ministerial Summit.

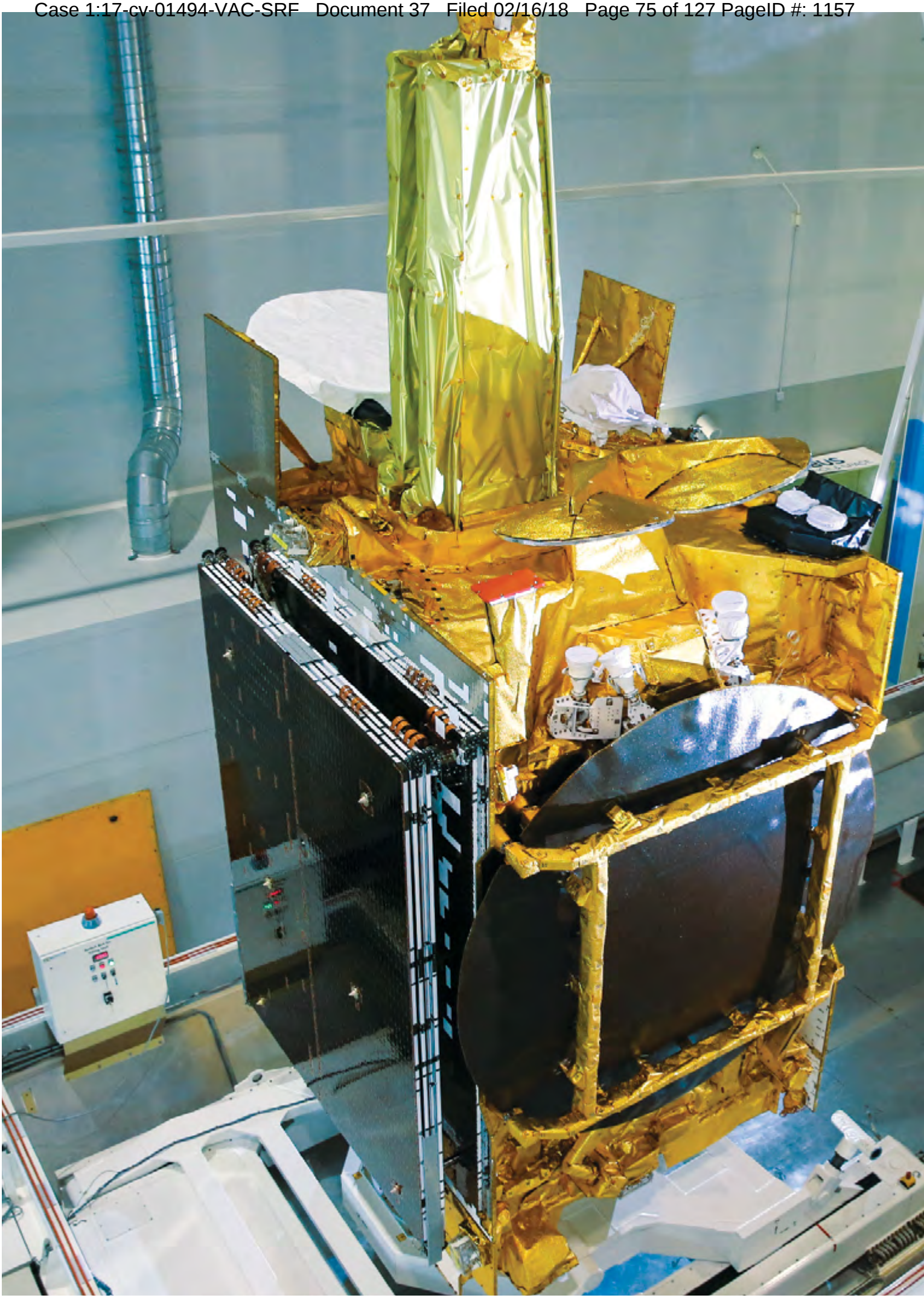
International Charter 'Space and Major Disasters'

The International Charter 'Space and Major Disasters' continued to provide rapid access to Earth observation data in support of disaster relief worldwide. It was activated 42 times in 2015, including for the large Nepal earthquake in April.

On 25 September, ESRIN welcomed 1300 space enthusiasts to the 10th edition of the European Researchers' Night (co-organised with Frascati Scienza), which received the greetings of the Italian President.

ESRIN hosted the Fourth IAA Planetary Defence Conference, with the theme of 'Assessing Impact Risk and Managing Response', organised by the International Academy of Astronautics from 13–17 April. The conference was devoted to near-Earth object discovery, characterisation, mitigation techniques and missions, and had as its aim the consolidation of decision-making processes to cope with threats.

From 3–6 March, ESRIN opened its doors *to around 1900 primary and lower secondary school pupils and their teachers for the 'Open Days'*



EDRS-A ready for shipping in Airbus Defence and Space's facilities in Toulouse, for transport to Kazakhstan for launch

telecommunications & integrated applications

The Directorate of Telecommunications and Integrated Applications (TIA) is involved in some of the most commercially oriented ESA activities, supporting European and Canadian firms as they strive to strengthen their position in the intensely competitive global markets for satellite communications and downstream applications, thereby securing the remarkable economic returns this sector can provide.

The key to success in this environment is stimulating innovation, not only in technology, but also in operations, project financing, risk-sharing and the integration of space-based technologies with non-space users and their systems.

TIA operates from five sites (Headquarters, ESTEC, ECSAT, Toulouse and Redu), with its main instrument being the programme of Advanced Research in Telecommunications Systems (ARTES). This has three areas of activity: support for the Core Competitiveness of European space industry, Public Private Partnership and Downstream Applications.

Core Competitiveness

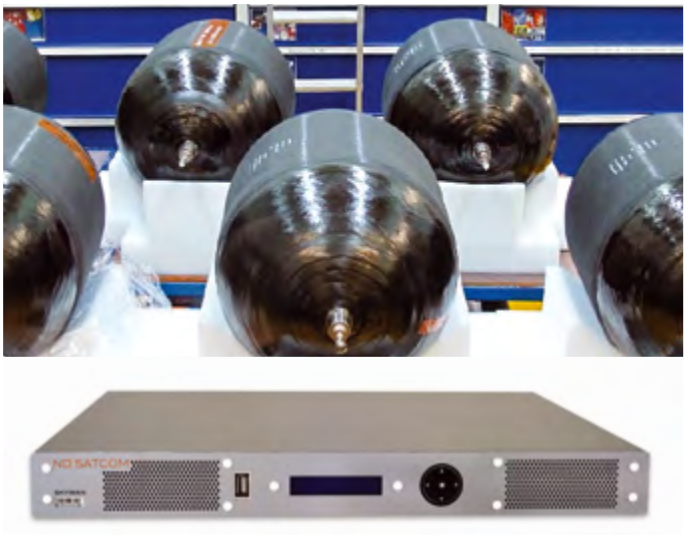
ARTES Core Competitiveness provides a single framework that allows industry to start with an idea and develop it through to the introduction of new products and services to market. There are three components: Future Preparations, Advanced Technology, and Competitiveness and Growth. During the year, 300 proposals were processed, 100 contracts signed with 280 running.

This mechanism is also adaptable to disruptive technologies. An industry workshop on mega-constellations in October attracted 200 delegates and introduced a new fast-track process for proposals. The aim is to ensure that European industry plays a major role in the overall supply chain that will build these new, game-changing constellations.

Public Private Partnerships

While the first generation of telecom public–private partnerships (PPPs) was initiated by ESA, the new ARTES Partner mechanism is successfully encouraging industry to take the initiative. This leverages public funding with private investment and ensures that risk in new ventures is allocated to those best able to handle it. Indeed, ESA now has PPPs in place with every major European satellite operator and manufacturer, and this can cover not only satellites, but also the ground segment.

The first PPP under the new ARTES Partner programme was for Electra. Three more PPPs were approved at the Ministerial Council in 2014 and all achieved contract signature in less than 18 months, demonstrating that TIA can move at the speed of the market.



High-pressure helium tanks *for spacecraft propulsion systems (above) and the new SKYWAN 5G network hub (below), both developed with ARTES support (OHB MT Aerospace/ND Satcom)*

Electra
The first fully electric propulsion satellite, being developed for satellite operator SES by OHB-System AG. Using full electric propulsion for orbit transfer and station-keeping results in savings in fuel consumption. Electra will also deliver communications capabilities similar to those of larger satellites while keeping launch mass below 3 tonnes, thus enabling the use of smaller, less expensive launchers. Phase-B1 was completed in June.

INDIGO (Intelsat Newtec DIaloG Open System)
The contract signed in June between ESA, Intelsat and Belgian company Newtec is the first aimed at delivering ground segment innovations, in this case for the Intelsat EpicNG constellation of high-throughput satellites.

Quantum
The most flexible payload yet designed, this in-orbit reprogrammable 'chameleon' satellite involves a PPP between ESA, Eutelsat and Airbus Defence & Space, signed in July.

The Quantum *satellite*

ICE
Expanding the range of mobile satellite services with Inmarsat at both L-band and Ka-band, the Phase-1 contract was signed in July at the UK Space Conference. The aim of the PPP is to develop an open architecture with standardised interfaces to ensure an easy entry point for application developers.

Progress has also been good with ESA-originated PPPs.

EDRS
The European Data Relay System, or 'SpaceDataHighway', reached several milestones in 2015, notably the successful testing of an optical link between Sentinel-1A and the EDRS terminal on Alphasat (itself the result of an earlier PPP). EDRS-A was delivered in December for launch on board a Eutelsat satellite in January 2016. The EDRS Mission Operation Centre is at Ottobrunn, Germany, with Redu in Belgium serving as a backup.

SmallGEO
Addressing the under-3-tonne market; the first satellite using this platform will be Hispasat's H36W-1. The spacecraft successfully underwent mechanical and thermal vacuum tests at IABG during the first half of the year and will continue its test sequence to be ready for a launch in late 2016.

Neosat
The Next Generation Platform programme element supports the development and demonstration in orbit of new satellite platform product lines for the 3–6 tonne market, in partnership with industry. The first examples are Spacebus NEO (contract signed in September with Thales Alenia Space) and Eurostar NEO (contract signed in November with Airbus Defence & Space). The first launches for both types are scheduled to take place by 2019.

SAT-AIS
Microsatellites equipped with Automatic Identification System (AIS) receivers will make it possible to track seafaring vessels anywhere on Earth, beyond the reach of coastal radio stations.

Iris
Involving a consortium of more than 30 organisations led by Inmarsat, Iris aims to create the air traffic management (ATM) component of the Single European Skies ATM research programme (SESAR). Progress in 2015 will enable flight trials to get under way early in 2016.

Downstream Applications (IAP and Satcom Apps)

Just over half of the 142 companies that signed contracts for IAP (Integrated Application Promotion) activities during the year were newcomers. This reflects an extensive outreach programme, including workshops organised by Ambassador Platforms targeting user communities across a wide range of markets. The greatest example of this was the annual ARTES Applications Workshop, which was integrated within the LIFT conference in Geneva.

A notable market-specific event was the fifth RPAS workshop at ESTEC, organised with the European Defence Agency, European Aviation Safety Agency and Eurocontrol. This followed the start of the DeSIRE II demonstration project, which supports the development of services provided by Remotely Piloted Aircraft Systems (RPAS) flying in non-segregated airspace.

Other sector workshops covered transport, farming, offshore energy and education for rural schools in Africa and the 'Space

Space helps ebola patients: *laboratory in Guinea, part of the IAP project 'B-LIFE'*

for Med' programme, a joint undertaking with the European Investment Bank to address opportunities for European industry within North Africa and the Middle East.

One development of long-term significance was the signing of an agreement with Seraphim Capital to cooperate on the first Venture Fund dedicated to space companies, the 'Seraphim Space and Special Situations Fund', to be launched in 2016.

Communications and Promotion

The ARTES programme reaches out to industry and user communities through its dedicated websites for mainstream telecoms and applications respectively, ***artes.esa.int*** and ***artes-apps.esa.int***.

Since the end of 2014, the sites have gained 66 000 and 76 000 users respectively, achieving a combined total of over 900 000 page views. They have published a total of 220 news and events articles, 500 project webpages and 200 funding opportunities.

Efficiency, ISO and Management Actions

For ESA-initiated activities in the ARTES Advanced Technology Workplan during 2015, the team achieved an improvement of approximately 10% in the procurement time to contract.

To improve the quality of TIA's work, the culture necessary for the effective adoption of ISO processes is being continually developed across the Directorate. This has led to systematic tracking of anomalies, with robust and sustainable corrective measures. A coherent, stable risk management process has been implemented, enabling effective monthly reporting and decision-making at Director and Heads of Department level.

Financial Performance and Socio-economic Impact (SEI)

A recent study by consultancy London Economics estimated typical returns on public investments for ESA Member States in telecom projects at between €12 (direct returns) and €21 (including indirect returns) for each euro invested.

ARTES Core Competitiveness delivers a remarkable success rate and has become the most successful satcoms technology initiative in Europe. To date, 60% of its Technology Phase activities were followed up with a Product Phase resulting in new products and services entering the market.

Across the ARTES applications programmes, analysis of 194 completed projects shows that 57% have so far created operational services and a total of 39% are generating revenues, of which 70% come from exports.

A recent Technopolis study estimated that over the past decade, the ARTES programme overall has created 2000 jobs and maintained 2000 more.

ecsat

The Director of TIA is also Head of Establishment at ECSAT, the Agency's newest centre, in Harwell, near Oxford, UK. The ECSAT building was inaugurated in July by the UK Minister of State for Universities and Science, together with the Director General.

The majority of staff members at ECSAT are from TIA, but it is also home to the ESA Climate Office and to some activities focused on robotic exploration and sample curation.

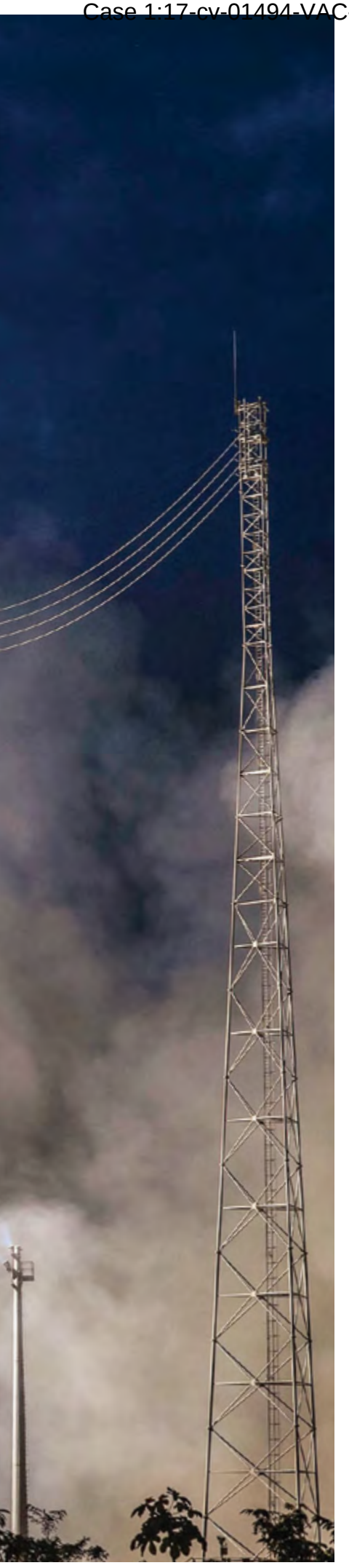
Harwell has been designated the 'UK Space Gateway', home to a fast-growing space cluster, and ECSAT is correspondingly the first ESA centre to be integrated into an open innovation campus, with an emphasis on knowledge exchange. It can accommodate 120 people and includes a conference facility that is becoming popular among the space community both on campus and beyond.

redu

Discussions on the growth of Redu covered a possible new building mainly for technical control rooms for ESA missions (Proba) and Galileo In-Orbit Testing in a state-of-the-art environment. Exploitation of the north extension is planned to be included in the perimeter of the centre and equipped to host a first antenna set to be operational in 2017.

ESA Director General Jan Woerner, together with Roy Gibson *the Agency's first Director General, at the inauguration of ESA ECSAT on 9 July*

galileo & navigation-related activities



Left: liftoff of Soyuz flight VS11 *carrying Galileo FM 03 and 04, 27 March 2015, from Europe's Spaceport in French Guiana*

The highlights of 2015 were the launch of six additional Galileo Full Operational Capability (FOC) satellites, FM 03, 04, 05, 06, 08 and 09, thus doubling the total number of satellites in orbit with respect to 2014.

The signature by the GSA (European GNSS Agency) and ESA, in July, of the Working Arrangement for EGNOS exploitation, and the signature, in October, of the Delegation Agreement between ESA and the EU on the further implementation of the Horizon 2020 – Framework Programme for Research and Innovation in Satellite Navigation, were major programmatic milestones.

Galileo In-Orbit Validation Phase

All activities required to achieve formal closure of all IOV (In-Orbit Validation) industrial contracts have proceeded. IOV FM 01, 02 and 03 Signal-in-Space transmissions continued on all carriers with a valid navigation message. IOV FM 04 is transmitting on E1 carrier frequency with a dummy navigation message only.

Galileo Full Operational Capability Phase

Concerning Full Operational Capability (FOC) satellites FM 01 and 02, orbit-raising manoeuvres and payload In-Orbit Test campaigns were completed. ESA considers FOC satellite FM 01 and 02 Mission Recovery activities successfully completed from a spacecraft point of view. ESA has submitted to the EC a technical note underlining the operational benefits of these satellites as part of the Galileo system.

Right: the Galileo FOC FM1 payload *laid out in SSTL's cleanroom for final tests before being boxed up for delivery to OHB (SSTL)*

The upper composite containing Galileo FMs 05 and 06 *was transferred to the launch pad on 7 September 2015 (ESA/CNES/ARIANESPACE-Service Optique CSG)*

FOC satellites FM 03 and 04 of the constellation were launched and injected into medium Earth orbit on 27 March from Europe's Spaceport in French Guiana on board Soyuz flight VS11.

The constellation deployment continued with the launch of the third pair of FOC satellites FM 05 and 06 on 11 September, followed by the launch of FOC FM 08 and 09 on 17 December. Platform commissioning was completed fully in line with predictions and payloads have been activated.

Production of Galileo FOC satellites is proceeding according to plan at the OHB facilities in Bremen, Germany, with a positive stabilisation occurring in the production rate.

The Ground Mission Segment V2.1 migrated on the two Ground Control Centres in the last quarter of 2015, without interruption of the nominal navigation data broadcast. The Ground Control Segment version deployed in mid-2015 continued to support routine operations and validation activities nominally, with fully automated operations for all the spacecraft.

Delta qualification activities to adapt Ariane 5 for the launch of Galileo satellites in 2016 were ongoing throughout the year.

ESA has finalised a Long-Term Plan and FOC2 Roadmap providing an overall plan of activities and cost estimate until 2021.

EGNOS Exploitation Phase

The EGNOS activities carried out under the EC/ESA Delegation Agreement were mainly devoted to the resolution of obsolescence and the modernisation of the EGNOS infrastructure. In 2015, Ranging and Integrity Monitoring Station (RIMS) channels were deployed in Haifa, Israel, in cooperation with ESSP and the hosting entity.

The GSA/ESA Working Arrangement on the future implementation of the EGNOS programme entered into force on 7 July, following the signature by the GSA Executive Director and ESA Director General. The activities carried out in this framework were mainly devoted to the preparatory activities for the procurements of system release V2.4.2 and the new-generation EGNOS V3.

Galileo FM 08 and 09, *mated with their dispenser on top of their Fregat upper stage being encapsulated within their Soyuz fairing, ready for launch on 17 December (ESA/CNES/Arianespace/Optique vidéo du CSG/JM Guillon)*

European GNSS Evolution Programme (EGEP)

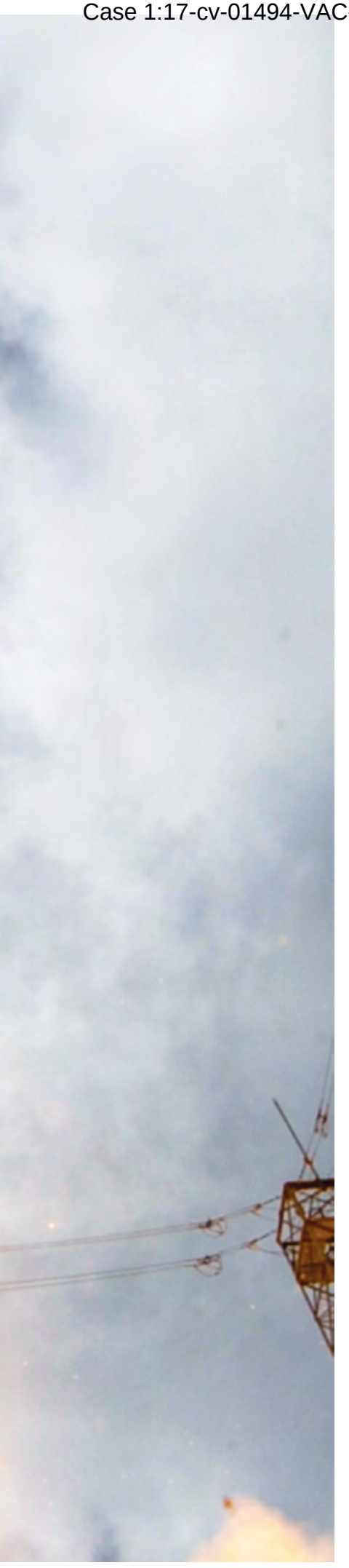
In Galileo Evolutions, activities in support of system Phase-A activities were initiated in coordination with the EC. Detailed design has been progressing through the Space Segment Requirements Review and the start of the satellite-level Preliminary Requirements Review.

For EGNOS V3, the main achievement was the completion of both parallel Phase-B2 definition studies. For the preparation of its next phase (implementation), ESA is now operating under the GSA/ESA Working Arrangement.

Regarding GNSS cross-cutting activities initiated through the Announcement of Opportunities for Scientific and Innovative Technology, 28 activities are running nominally and two were completed.


ESA

launchers



Vega VV04 *carrying ESA's IXV spaceplane lifted off from Europe's Spaceport in Kourou, French Guiana, on 11 February 2015*

Launcher exploitation programmes

Ariane 5 exploitation

Six Ariane 5 missions were carried out in 2015, placing in orbit two European institutional satellites (Sicral 2 and MSG-4), and 12 commercial satellites.

These achievements are the result of several activities put in place for the maintenance of the qualification status of the Ariane 5 launcher system, which are performed in the framework of the Ariane ARTA and LEAP programmes. Regarding Ariane 5 ES adaptation for Galileo, activities in 2015 converged towards the Launch System Technical Qualification Review to be completed with the Steering Board in early 2016. No new technical issues were raised. The first launch of four Galileo satellites by Ariane 5 ES is scheduled for mid-October 2016.

Activities on future Ariane missions have focused on Ariane 5 ECA performance improvement. In this frame the payload loading capacity of the launcher has achieved an actual performance of 10.3 tonnes in geostationary transfer orbit. An additional step of activities, named Ariane 5 ECA Upper Part Adaptation was performed in 2015, enhancing generic performance from 10.3 tonnes to about 10.7 tonnes. In addition to the above, activities for the maintenance in operational condition (MCO) of facilities were implemented in 2015, as provided for in the declaration on the Ariane LEAP programme. About 60% of the MCO activities covered by the LEAP period 2015–16 had been committed to by the end of the year.

Vega exploitation

Three Vega missions were carried out in 2015, launching two ESA and one EU payload (VERTA IXV/VV-04, Sentinel-2A/VV-05, VERTA LISA Pathfinder/VV-06) and thus completing the VERTA flight programme and achieving the VERTA programme objectives.

Europe's Spaceport, the Guiana Space Centre

Twelve launch campaigns (six Ariane 5, three Vega and three Soyuz) were performed at the Guiana Space Centre (CSG) in 2015 with 21 payloads processed in the EPCU (payload preparation complex) at CSG.

Several initiatives were started aimed at improving the industrial return of a number of Member States at CSG. Among these initiatives were the 2015 CSG Industry Days, held in Kourou on 23 and 24 April and in Paris on 6 and 7 May. A significant number of companies attended the events and very positive feedback was received from industry representatives.

The last weather satellite *in Europe's highly successful Meteosat Second Generation (MSG) series lifted off on Ariane 5 flight VA224 on 15 July*

Launchers development programmes

The historic decisions taken during the Ministerial Council in 2014 included the creation of a self-standing programme for the development of the new European family of launchers. The declaration on the programme for Ariane and Vega development subscribed at that time included four programme elements: Ariane 6, P120C, Vega C and Launchers Evolution.

On 12 August, contracts were signed with Airbus Safran Launchers (ASL) for the development of Ariane 6, with CNES for the launch base, and with ELV for Vega C Launcher System development and qualification. The activities for the development of P120C have been included in the contracts for Ariane 6 launcher system development and Vega C launch system development and qualification. In accordance with the Participating States' decisions, the aforementioned contracts with ASL and CNES are to be implemented in two steps. The decision to proceed with Step 2 will be taken after the Programme Implementation Review in September 2016.

Ariane 6

The technical activities for Ariane 6 development started in March following the ESA Authorisation to Proceed both on the Launcher System and Launch Base. The activities for the Ariane 6 Launcher System proceeded as planned and the industrial structure took shape according to the Industrial Procurement Plan. Several subcontracts have already been signed; a number of invitations to tender have been issued by industry and some proposals are already under negotiation.

Regarding the Ariane 6 Launch Base, earthworks activities started in French Guiana in July with completion expected in May 2016. All the site zones have been cleared, foundations for roads completed and the first anti-capillarity layer installed. In parallel, the launch complex infrastructure and Control Bench Preliminary Design Reviews have been conducted.

An Ariane 6 Launch Base industry day was held in November presenting activities to be undertaken regarding the construction of the Ariane 6 Launch Complex to potential interested firms.

For the implementation of the Ariane 6 Launch System Architect tasks, ESA is setting up a dedicated project organisation, including the specific competences of ASL for Launcher System matters and of CNES for Launch Base matters. Several co-engineering sessions have been held (notably on the launch vehicle integration approach) and the results of these sessions translated into the Launch System Requirements Document and Interface Requirements Document.

Vega C

The activities at launch vehicle system level advanced on schedule for the baseline configuration based on P120C/Z40/Z9/AVUM+. The Phase-A activities on the Vega C Launcher System have been completed and the Launch System Requirements Consolidation Key Point was completed at the end of 2015. The Launcher System Preliminary Design Review began in 2015, to be concluded at the beginning of 2016. Activities also started to allow the Launch Base and Launch System Preliminary Design Reviews to proceed according to schedule in 2016.

The possibility to introduce an enlarged fairing in the Vega C baseline is under consolidation taking into account the modification of P120C.

Regarding the Vega C Launch Base, the activities concerning the feasibility study for the Launch Complex Ground Proximity Means have been finalised, and the negotiation of the proposals for Launch Complex Ground Support Means and Launch Range Vega Complementary Means have been initiated. Safety preparatory activities have been completed and the Safety requirements and Safety process have been consolidated.

P120C

The P120C solid rocket motor Preliminary Design Review was concluded in September. No blocking points were identified for the critical procurement of long lead items. The Preliminary Design Reviews for main components have also been completed.

Concerning the P120C performance increase, the Ariane 6 and Vega C launcher system primes informed industry that P142 is the new reference. The impacts on the solid rocket motor (SRM), Loaded Motor Case/Insulated Motor Case, Nozzle and associated facilities have been identified, which will require Delta

ESA signed contracts for the development of Ariane 6, *its launch base and the Vega C evolution on 12 August 2015. From left, Alain Charmeau, CEO/President of ASL; Pierluigi Pirrelli, CEO of ELV; Jan Woerner, ESA Director General; Gaele Winters, ESA Director of Launchers; and Jean-Yves Le Gall, President of CNES*

Preliminary Design Reviews. An impact of seven months' delay in the SRM development plan is expected, without any impact on the launch date for the Ariane 6 maiden flight. With respect to Vega C, the increased performance will make it possible, together with the more voluminous fairing, to enlarge the accessible market for Vega C. An impact on the Vega C maiden flight, with a delay to mid-2019, has been identified as a consequence of the modification of P120C. Regarding the Insulated Motor Case, new technology and second production line, a stepped approach considering technical and contractual conditions was agreed among the different parties.

Launcher Evolution Element

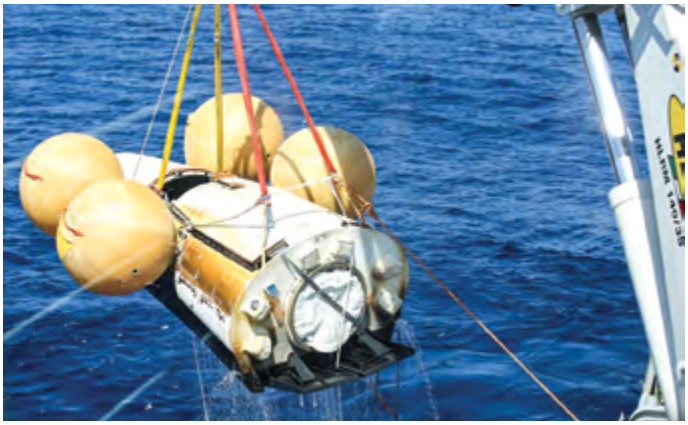
Following the subscription of the Launcher Evolution Element (LEE) at the 2014 Ministerial Council, initial activities have been contracted with ASL. The primary focus of the initial activities is on the system studies needed for the definition of a promising reusability concept and to determine the system requirements for the reusability and methane engine demonstrators. Preparatory activities linked to methane engine demonstrator are being performed in parallel through a national contract by CNES with a view to including this activity in the LEE programmatic framework in 2016.

Future Launchers Preparatory Programme (FLPP) Period 3

FLPP Period-3 continuation proceeded as planned in the areas of integrated demonstrators and technologies. The main progress has been on the integrated demonstrators including the Expander-cycle Technology Integrated Demonstrator, the Hybrid Propulsion Demonstrator, the storable propulsion 5 kN engine, the solid propulsion POD-X, the CRONUS Cryogenic tank demonstrator activities and the Composite Booster Casing Demonstrator.

Intermediate eXperimental Vehicle (IXV)

The Intermediate eXperimental Vehicle (IXV) mission was carried out on 11 February following a launch on a Vega rocket from French Guiana, flight-testing critical pioneering systems and technologies in conditions fully representative of a return from low Earth orbit. In particular, it demonstrated in flight advanced systems and technologies necessary to return from space to Earth, such as lifting-body performance for precision landing, advanced high-temperature resistant materials, guidance navigation and flight control techniques, aerodynamics and aerothermodynamics. During flight phase, the IXV performed the whole flight programme in line with commanded manoeuvres and trajectory prediction, with an overall flight of 25 000 km (8000 km with hot atmospheric reentry) under automatic guidance, ending with a successful precision landing. The early post-flight findings confirmed that the IXV space and ground segments worked perfectly. All the activities related to post-flight analysis will continue within the framework of the PRIDE programme.



Recovery of ESA's Intermediate eXperimental Vehicle *in the Pacific Ocean just west of the Galapagos islands on 11 February*

Programme for Reusable In-orbit Demonstrator in Europe (PRIDE)

The PRIDE programme objectives, building on the success of the IXV programme, were refocused at the last Ministerial Council and four new participants have joined the programme (France, Spain, Sweden and the United Kingdom). The PRIDE high-level mission requirements were finalised, targeting a Reusable Integrated Space Transportation System to be launched with the Vega C launch system, with a payload mass capability higher than 300 kg for a variety of orbit altitudes and inclinations (including the ISS orbit), able to operate in orbit, deorbit, reenter, land on the ground and be relaunched after limited refurbishment. Based on the above, PRIDE industrial activities are set to get under way in the beginning of 2016.

FACTS & FIGURES

5 Ariane launches

3 Vega launches

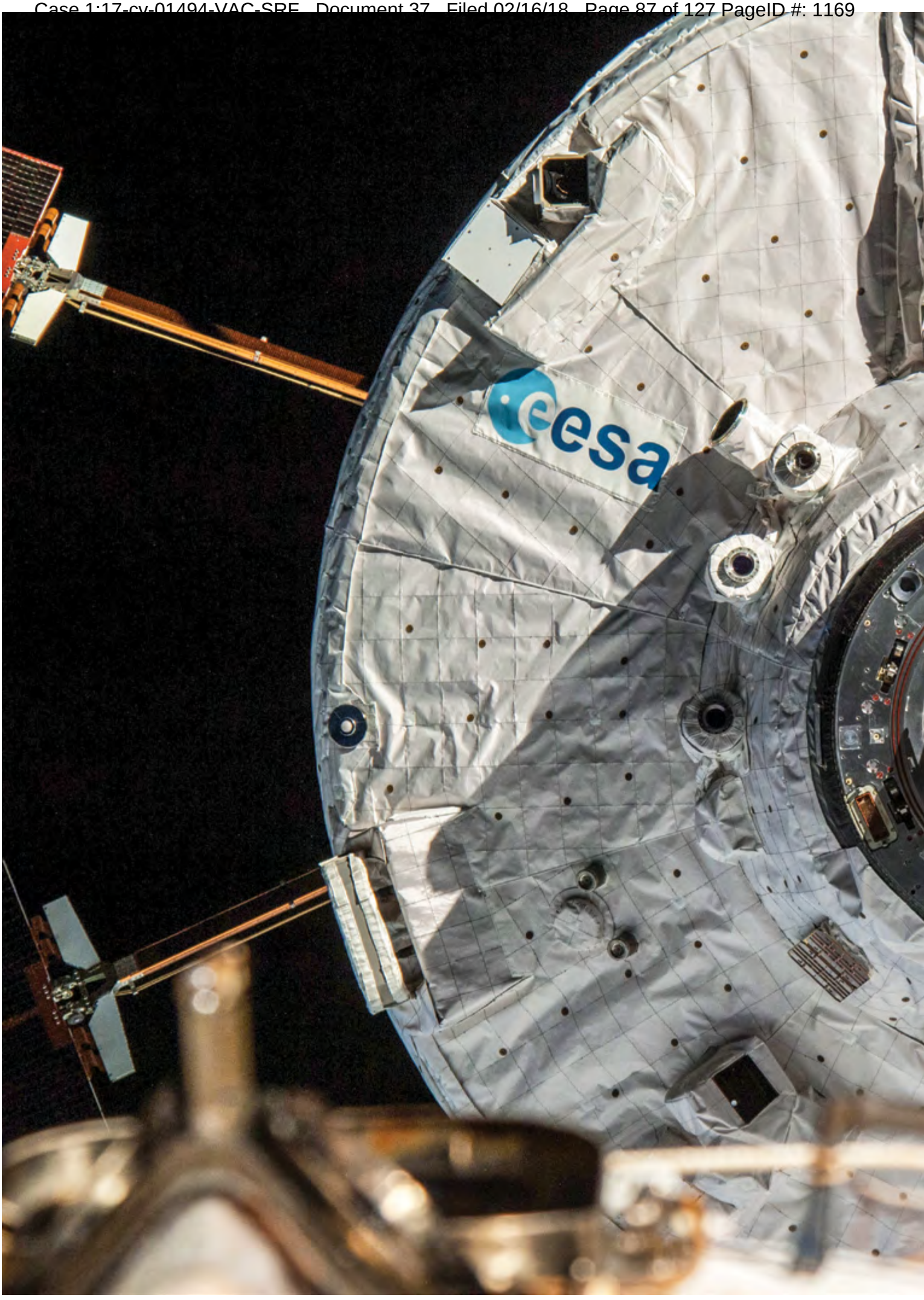
5 institutional missions (Sicral-2, MSG-4, IXV, Sentinel-2A and LISA Pathfinder)

3 Galileo missions on Soyuz at CSG

12 commercial satellites

12 launch campaigns (5 Ariane, 3 Vega and 3 Soyuz)

21 payloads processed in the EPCU payload preparation complex


esa

human spaceflight & operations

ATV George Lemaître, *approaching the International Space Station, whose mission ended with reentry on 15 February 2015 (NASA/ESA)*

Highlights

2015 was an exciting year for European participation in the ISS programme with three ESA astronauts working on the International Space Station (ISS). The Futura mission of Samantha Cristoforetti started on 23 November 2014 and ended on 11 June 2015 with the landing of Soyuz TMA-15M in Kazakhstan with Terry Virts (NASA) and Anton Shkaplerov (Roscosmos). The mission was a flight opportunity from the Italian space agency ASI as part of a bilateral agreement with NASA. Samantha spent 199 consecutive days in space, setting new records for the longest single spaceflight for an ESA astronaut and for a female astronaut.

Samantha was followed by Andreas Mogensen, launched on Soyuz TMA-18M on 2 September, for his short-duration 'iriss' mission. Following an intensive science programme, Andreas landed safely landed with Soyuz TMA-16M on 12 September. His 'direct return' from Kazakhstan to the European Astronaut Centre (EAC) in Cologne was completed within 12 hours of the Soyuz landing.

Finally, Tim Peake was launched on Soyuz TMA-19M on 15 December, with NASA astronaut Tim Kopra and Russian cosmonaut Yuri Malenchenko. Tim Peake's Principia mission was extended by four weeks and the landing rescheduled for the third week of June 2016. An extensive education programme involving 5000 UK schools was delivered together with the UK Space Agency.

SpaceX CRS-6 docked with the ISS on 17 April. The vehicle carried around 2000 kg of resupplies, including the new ESA experiment TripleLux-A. Unfortunately, the SpaceX CRS-7 vehicle suffered a launch failure on 28 June, and 32 kg of ESA cargo was lost.

An important milestone for ESA was the end of the ATV *George Lemaître* mission with reentry on 15 February, bringing to a close the successful Automated Transfer Vehicle (ATV) programme. The planned shallow reentry was cancelled because of increased risk following the failure of a Power Control and Distribution Unit.

Andreas Mogensen *at work inside Columbus during his 'iriss' mission (NASA/ESA)*

Samantha Cristoforetti *during her Futura mission (NASA/ESA)*

This was also a record year for the Directorate of Operations, with four launch and early orbit phases (LEOPs) conducted from ESOC in a calendar year (Sentinel-2A in June, MSG-4 in July, fifth Galileo launch in September and LISA Pathfinder in December), and another three LEOPs supported by Operations staff in other control centres (IXV in February from ALTEC/Turin, fourth and sixth Galileo launches in March and in December from CNES/Toulouse). At the same time, the number of spacecraft in routine operations phase being controlled from ESOC and Redu reached 20, another all-time record.

Among the missions in routine operations, Rosetta performed its main scientific mission around the comet, reaching the perihelion in August. This presented new challenges to the Operations teams, who had to adapt the spacecraft trajectory and operations approach to the increasing activity of the comet, which caused severe problems to the star trackers due to the high dust density around the spacecraft. Sporadic contact was established with Philae in the summer, but the environmental conditions and weakness of the radio signal did not allow for further lander operations.

ISS

European Robotic Arm (ERA)

The Multipurpose Laboratory Module (MLM) launch delay from March 2017 to the end of 2017 was announced by the Head of Roscosmos Igor Komarov during the MAKS Airshow in Moscow in August. Work on the MLM project, on which ERA will be launched, has been restarted. Both MLM and ERA will be transferred to the launch site in February 2017.

Atomic Clock Ensemble in Space (ACES) and Atmosphere-Space Interaction Monitor (ASIM)

Some technology issues have been encountered with the ACES Hydrogen Maser, which caused a delay of about six months on the readiness of the payload. ACES and ASIM are still planned to be launched on SpaceX CRS-13 in August 2017.

Astronauts

Luca Parmitano participated as crew commander in the NASA Extreme Environment Mission Operations (NEEMO) 20 mission in Florida in July and August.

Research

ISS Utilisation

In total, 291 ESA experiments have been conducted on the ISS since it has been in orbit; 179 experiments since the launch of Columbus in 2008, out of which 51 were implemented/active in 2015. Since the Columbus launch, ESA's ISS experiments involved a total of more than 840 scientists (including about 190 international science team members).

Eight astronauts (including three ESA astronauts) were involved in ESA life science activities on the ISS as test subjects in 2015. This work included research into improved understanding of the effect of long-duration spaceflight on alterations in circadian rhythms; the existence, extent and mechanisms of post-reentry bone loss; an integrative study on the complex interactions of cognition, stress and immunity; skin-ageing mechanisms; and headache incidence. Numerous pre-/post-flight human research experiments were also undertaken covering areas such as the effect of long-duration spaceflight on the human central nervous system, skeletal muscle function and change in straight-ahead perception.

In biology, the TripleLux-A and -B experiments were processed in the Biolab facility. The Endothelial Cells experiment was completed in KUBIK and initial post-flight microscopy indicated excellent quality of the fixed cells. A number of other experiments were completed.

The Expose-R2 astrobiology facility completed a year of exposure outside the ISS, hosting experiments that could help explain the origin of life on Earth and the survivability of samples to conditions on the Moon and Mars.

In physical sciences, the first set of alloy samples completed processing in the Electromagnetic Levitator and a second set has started. These experiments will help to optimise industrial casting processes.

In complex plasma physics the Plasma Kristall-4 (PK-4) facility completed its first science campaign with the main interest in the investigation of the liquid-like behaviour of complex plasmas.

The Solar and DOSIS-3D payloads continued to monitor solar/radiation environments through the year.

Non-ISS Utilisation

The Maser-13 sounding rocket was launched on 1 December and all modules, one fluids research module, two materials solidification modules and one biology module with two experiments, operated successfully.

Three parabolic flight campaigns with one being carried out jointly by ESA, CNES and DLR, took place with the new Airbus A310 aircraft. In total, 28 ESA experiments were carried out including the validation of the VIP-GRAN design concept for ISS.

Three drop tower campaigns were completed including a student 'Drop Your Thesis' campaign.

A 60-day bed rest study at DLR was started on 9 September. The update of the ESA bed rest strategy and the planning of the future studies have started.

***Tim Peake** boards his Soyuz ready for launch on his Principia mission*

A Concordia Antarctic winter-over isolation campaign was concluded with five ESA experiments. A first cooperative winter-over campaign was also completed with the British Antarctic Survey at the Halley VI station with two ESA pilot experiments.

Exploration

Multi-Purpose Crew Vehicle/European Service Module (MPCV/ESM)

The key achievement in 2015 was the integration and timely delivery of the ESM Structural Test Article (E-STA). The E-STA was shipped from Turin, Italy, and arrived at the NASA Plum Brook facility on 9 November to undergo dynamic environmental testing.

Several important design changes at system level were agreed with NASA. Among those changes is the manufacturing of a second STA which will make it possible to recover the schedule delay caused by other NASA change requests and reduce some risk in the overall structure test logic. The system Critical Design Review is now scheduled for 2016.

The delivery of Flight Model 1 (FM1) to Kennedy Space Centre on 29 January 2017 remains challenging. The project's cost-at-completion estimate is within the approved budget.

Agreement with NASA to use the ESM2 as a barter element for the ISS CSOC 2021–24 is progressing well.

Multi-Purpose End-To-End Robotic Operation Network (METERON)

Two METERON experiments were concluded during the iriss mission by Andreas Mogensen. One was the Haptics-2 experiment, which is the first space-to-ground control experiment with force-feedback. A force-feedback joystick in Columbus on the ISS was connected in real time to a similar joystick at ESTEC in the Netherlands. The Earth-based joystick directly copied any motion/force exerted on the ISS-based joystick (and vice versa).

The SupvisE experiment was also successfully executed during the iriss mission. With ESTEC, ESOC, BUSOC, Huntsville and White Sands in the loop and five video streams active between ground and the ISS, two rovers conducted a realistic lunar robotic operations scenario (offloading a lunar lander). One rover was controlled from the ISS by Andreas Mogensen and the other from ESOC.

Lunar Exploration Activities

The development of two exploration products has been initiated, namely PILOT (innovative autonomous technologies for precise and safe landing) and PROSPECT (drilling at low-temperature and regolith sample analysis). The next step (Phase-B+) has been prepared, and extensive hardware and software pre-development activities will be conducted in 2016–17. In parallel, programmatic and technical cooperation with Roscosmos has been set up to fly those products on board the Russian Luna-Resource lander planned for launch in the 2020–21 timeframe.

Other activities to prepare the next step in lunar exploration and build up a lunar exploration user community have been initiated including mission studies for lunar mobility and for sample return.

International Berthing Docking Mechanism

The discussion of the technical and programmatic aspects of the ESA cooperation with US-based Sierra Nevada Corporation (SNC) for the supply of the International Berthing Docking Mechanism (IBDM) to the Dream Chaser vehicle was completed and SNC made a proposal to NASA for the ISS Cargo Resupply Services slice 2 contract (CRS-2) using the IBDM as their Dream Chaser nominal docking system. The development programme was set up through dedicated negotiations with the delegations of the interested Member States, which required some industrial financial contribution to mark the commercial character of the cooperation. The programme will start as soon as all aspects of the NASA/SNC contract have been negotiated.

Operation Avionics Subsystem (OAS)

A European industry team completed their work at the SNC premises in Denver, Colorado in support of the Dream Chaser vehicle, and potential collaboration items identified. The work on the development of the cockpit mock-up in Belgium was completed.

Strategy

International Cooperation

Following the signature in September 2014 of the ESA/CMSA Agreement, a first meeting took place in Beijing on 11 February to define specific activities and an action plan for the three cooperation areas identified (astronauts, utilisation of space stations and interoperability).

International Space Exploration Coordination Group (ISECG)

ESA chaired the International Space Exploration Coordination Group (ISECG) workshop held in Pasadena, USA from 20–24 April and hosted the ISECG Senior Agency Managers (SAM) meeting at ESOC on 7 October. ISECG advanced the definition of a medium-term international human exploration mission scenario and the approach for engaging global science community in implementation of an ISECG Global Exploration Roadmap (GER).

Space Exploration Strategy

The ESA Space Exploration Strategy was published on the ESA portal in March. An assessment of private sector initiatives in the field of space exploration led to the release of a Call for Ideas named 'Space Exploration as a Driver for Growth and Competitiveness: Opportunities for the Private Sector' in March. Space and non-space private companies were invited to send ideas. From the 55 partnership ideas received, eight promising ideas were selected to enter a pilot phase — with no exchange of funds — in order to assess the technical feasibility and soundness of business case before potentially starting a fully fledged partnership.

Outreach

A number of initiatives were pursued to increase the outreach of European astronaut missions at national and European level. A large number of videos were produced. For Samantha Cristoforetti, 73 videos with more than 70 000 views, and for Andreas Mogensen, 71 videos with 30 000 views. The ISS 360-degree Panoramic Tour received more than 400 000 views. In-Flight Calls were facilitated to general public and education audiences. Information brochures were produced and distributed in paper form and online. An 8-minute video called 'Destination Moon', presenting the scientific rationale for Moon South Pole exploration missions, received more than 200 000 views. The first 4K video published by ESA, 'Alexander Gerst's Earth's Timelapse', received about 3 million views.

The Lunar Exploration web documentary was presented to the scientists and experts participating in the Moon 2020–30 symposium in December 2015, and received very positive feedback. The Erasmus Centre hosted more than 19 000 visitors in 2015 (compared with 17 000 in 2014).

EAC initiated the LUNA-European Exploration Lab, beginning with a lunar surface analogue, which will support the preparation of human/robotic surface exploration technologies. About 16 000 people visited EAC, including about 8000 on German Space Day.

Space Traffic Management / Space Situational Awareness

Development of the SSA-SWE (Space Situational Awareness – Space Weather) Segment has continued with the leveraging of European SWE assets and expertise. New space weather precursor services have been available to end users in 2015–16 including:

- A-EFFort (24-hour forecast service of major solar flares) developed by the Research Center for Astronomy and Applied Mathematics (RCAAM) of the Academy of Athens;
- RESOSS (tailored geomagnetic and ionospheric services to support resource exploitation) developed in collaboration between the Tromsø Geophysical Observatory and Norwegian Mapping Authority);
- AVIDOS 2.0 (radiation doses at aviation altitudes incorporate dose increases during major solar events) developed by Seibersdorf Laboratories in Austria;
- Regional Aurora Forecast (RAF) developed by the Finnish Meteorological Institute (FMI);
- Ionospheric Scintillation Monitoring (ISM) developed by Collecte Localisation Satellites (CLS) in France.

The SSA-SWE Coordination Centre (SSCC) has provided tailored space weather messages to ESA's Gaia and Rosetta missions and alerts for solar energetic particle events to LISA Pathfinder and other ESA missions. In September, the SSA Programme started contracts for the definition and development of five thematic Expert Service Centres (ESCs) for solar weather, ionospheric weather, space radiation, geomagnetic conditions and heliospheric weather. These development activities will produce substantial enhancements to existing SWE precursor services and several new services to end users in 2016.

Development of the SSA space segment for space weather monitoring has continued with implementation of two hosted payload missions. The NGRM (Next Generation Radiation Monitor) instrument will be flown on board EDRS-C (European Data Relay Satellite) and the SOSMAG (Service Oriented Spacecraft Magnetometer) will be flown on the Korean GEO-Kompsat-2A mission. Both missions are planned for launch in 2018. Two parallel mission concept studies for dedicated space weather satellite missions to L1 and L5 points have been carried out with the final Mission Definition Reviews scheduled to take place in mid-2016.

In 2015, the technical web portal of the SSA-NEO (Near-Earth Object) segment at neo.ssa.esa.int underwent a major update. A number of new services are now available to the public: a comet database has been added to the system, information on discovery statistics has been added, and many small updates performed. Activities to extend the available tools are ongoing with notably the addition of tools to compute and visualise the ground track of potential asteroid impacts, a sky chart tool, an observation planning tool, and educational tools.

ESA hosted the 6th Planetary Defence Conference at ESRIN in May. It was attended by about 240 participants and included a simulated impact exercise.

A workshop with civil protection agencies was held in June at ESOC to discuss the information flow and needs in case of a realistic impact threat with input received during the workshop being used to feed into a NEO Information Plan.

Manufacturing of the prototype fly-eye telescope, a 1 m effective aperture NEO survey telescope, started under the leadership of CGS (Italy) and discussions on its location are ongoing.

A campaign to observe the reentry of the artificial object WT1190F took place in November. Also, a coordinated observing campaign of the ExoMars 2016 spacecraft composite just after launch was performed using the NEO cooperative network of telescopes.

ESA chaired the UN-sanctioned Space Mission Planning Advisory Group (SMPAG). The group met in November in the USA on the margins of the UN Scientific and Technical Subcommittee meetings and a legal subgroup was formed specifically to address legal issues related to a potential asteroid impact. ESA has been asked to continue chairing SMPAG.

The establishment of Expert Centres for passive optical and laser observations got under way after the completion of a requirements

The joint ESA/Altec/IXV team *at the ALTEC premises in Turin, Italy, for IXV launch and mission support (ESA/P. Shlyaev)*

analysis phase. The development of modular visualisation components and of a flexible SST (space surveillance and tracking) architecture analysis tool has started and is progressing rapidly. Significant effort has been put into standardisation activities addressing interfaces between sensors and an SST backend, as well as for products provided through the SST application layer. Some initial testing of the conjunction and reentry event prediction systems based on real data has been completed.

Mission operations

In 2015, ESA operated 17 spacecraft from ESOC, three from Redu and managed the increasing Galileo spacecraft fleet operations performed from Fucino, Italy, and the German Space Operations Centre GSOC in Oberpfaffenhofen near Munich.

Venus Express signal observations ended at the end of January. The last time a signal was received was 18 January. The spacecraft was estimated to re-enter in the atmosphere around the end of January.

IXV launch and mission support was operated by a joint ESA/Altec/IXV project team from the ALTEC premises in Turin, Italy, on 11 February.

Copernicus Sentinel-2A was launched on 23 June. All critical Launch and Early Orbit Phase (LEOP) and commissioning operations were carried out very smoothly and the satellite entered its routine mission as planned.

Rosetta established various contacts with Philae on the surface of the comet from 14 June to 9 July. Because of the relatively large distance of Rosetta from the surface, the contacts were not sufficiently stable to allow lander operations. No more sign from Philae was received after that, while Rosetta had to increase its distance from the comet due to the nucleus' high activity while approaching perihelion.

LEOP of MSG4 was carried out from 15 July to early August, when the handover to Eumetsat took place. LEOP of Galileo satellites FM 05 and 06 was performed from launch on 11 September until handover to Galileo control centre GCC-D on 20 September.

LISA Pathfinder long LEOP operations took place in December. Operations continued with the initial commissioning of the spacecraft and payload.

LEOP of Galileo satellites FM 08 and 09 (launch 17 December) was executed by the CNESOC team from Toulouse. Handover to GCC-D took place as planned on 25 and 26 December.

With three double launches, the Galileo constellation doubled from six to 12 satellites in orbit. The routine operations conducted by SpaceOpal in GCC-D and GCC-I under OPS management had to cope with this rapid increase in the number of satellites and with existing and new anomalies on the spacecraft side.

Ground Segment Engineering

The newly developed New Norcia 4.5 m acquisition aid antenna (NNO-2) has replaced the spacecraft LEOP and launcher tracking capability of Perth, which closed after 30 years of operations at the end 2015 due to access restrictions to radio spectrum. The combination with the existing 35 m antenna provides a unique capability to track launch vehicles up to geostationary orbit. Also a new 2 m spacecraft first signal acquisition antenna was established in Malindi, Kenya, that was instrumental for the LISA Pathfinder LEOP operation, and will continue to support future critical LEOPs.

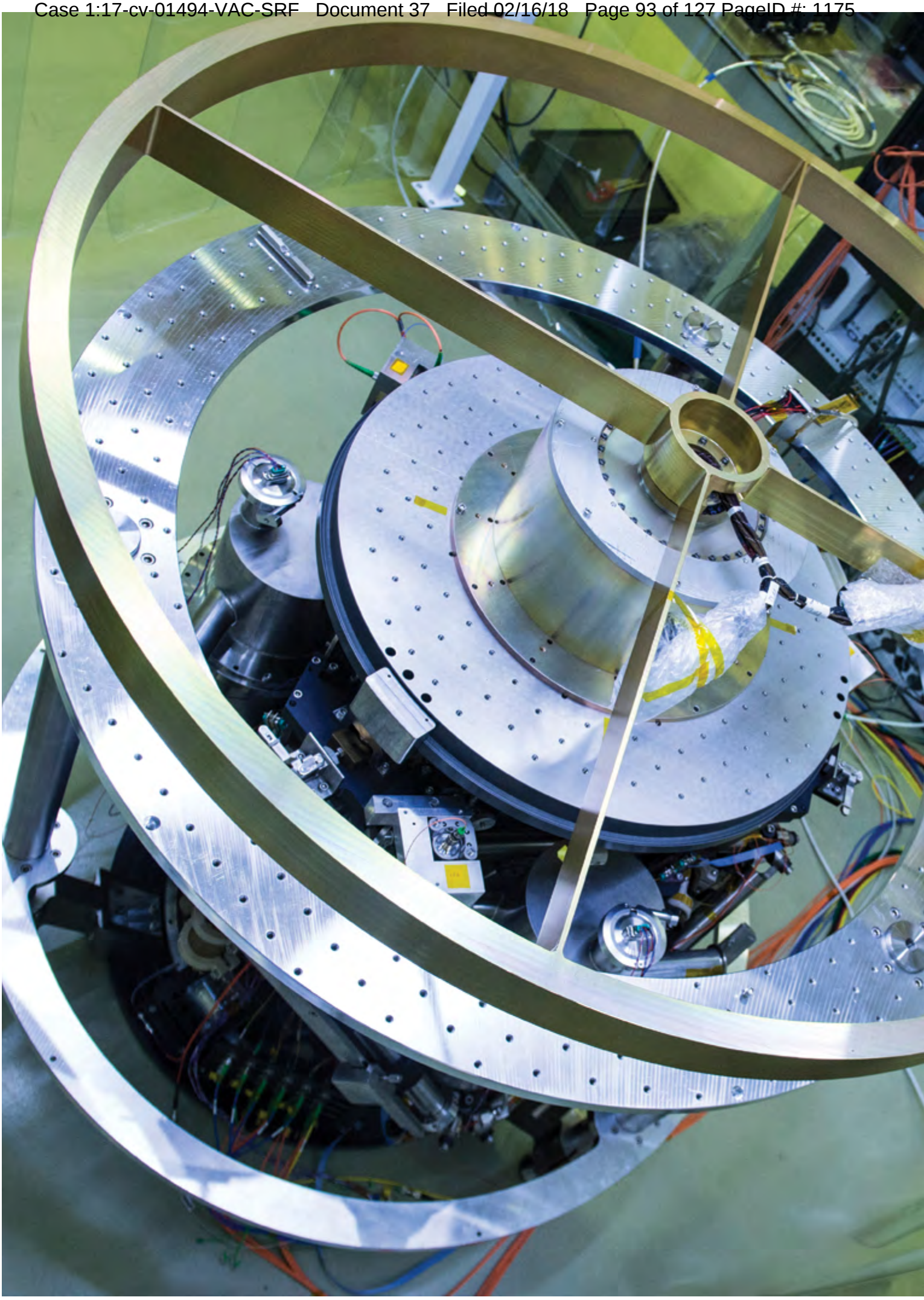
Ten collision avoidance manoeuvres had to be performed in 2015 by ESA Earth Observation and Copernicus programme satellites. The Operations conjunction assessment process has been significantly modernised and is now available to ESA and external missions on all types of Earth-bound orbits. An analysis carried out on the environmental consequences of so-called mega-constellations (>1000 satellites in low Earth orbit for space-based broadband services) emphasised the importance of adhering to space debris mitigation guidelines.

The European Ground Systems – Common Core (EGS-CC) is a European initiative, to jointly develop and exploit a common infrastructure for space systems monitoring and control in pre- and post-launch phases for all mission types and is being undertaken as a collaboration between ESA, European national agencies and European industry prime contractors.

The resulting products will be available within the ESA Member States to use and exploit commercially by building products on top. EGS-CC Phase-C/D started in mid-2015 and will be completed by mid-2017 with three development releases having been delivered in 2015.

End-to-end ground segment integration and testing capabilities in a mission operation representative environment are being deployed in the Ground Segment Reference Facility to increase quality and reduce delays with infrastructure system deliverables.

The Operations real-time global GNSS sensor station network has been extended to 16 sites, and upgrades to 30 stations are ongoing, along with the associated processing capability, which will provide navigation facilities with a unique capability for precise Galileo orbit and clock determination.



technical & quality management

SADM microvibration test set-up

The Directorate of Technical and Quality Management drives the performance of the Agency by marshalling the ongoing innovation and technical excellence needed to achieve ESA's future goals.

While other ESA Directorates incorporate their own specific research and development programmes, the Directorate of Technical and Quality Management is responsible for longer-term technology development, including generic technologies that bring benefits to all technical domains, while also supporting R&D infrastructure such as laboratories, test facilities and specialist sections covering every aspect of the space environment.

Preparation of the future

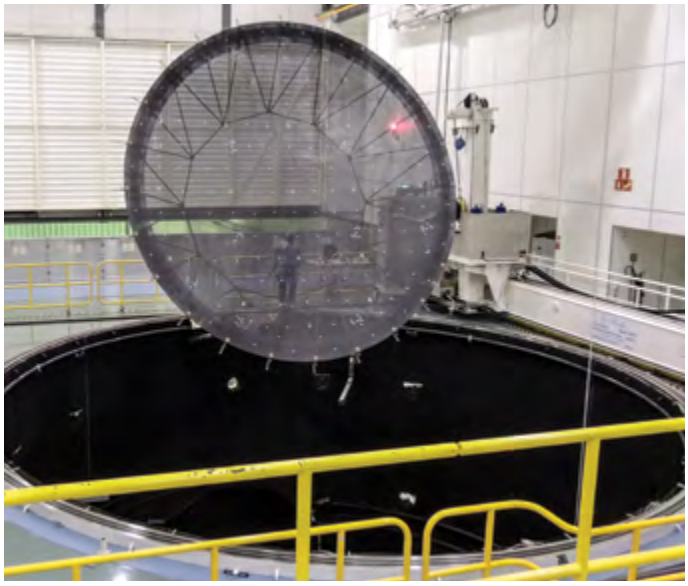
The first goal of the Directorate is to ensure enabling technologies are available at the point when ESA and European missions need them – one definition of innovation being 'the right technology at the right time'. The technical activities mentioned below exemplify the results achieved in 2015.

One important achievement comprises a low-mass configurable Solar Array Drive Mechanism (SADM), qualified in the framework of the General Support Technology Programme (GSTP) and now flying on the Sentinel-3A spacecraft.

Design optimisation, analysis and testing activities associated with minimisation of microvibration exported by spacecraft mechanisms have been conducted. Earth observation missions with high pointing requirements have been the principal focus of such work. SADMs are significant contributors to a spacecraft's overall depointing, as such special effort has been placed in estimating the pointing error due to the SADM rotation and the dynamics of the solar array wings.

In this framework, simulation techniques that can accurately predict the pointing performance when subjected to the SADM-induced disturbance have been further developed and refined. The analytical models have been correlated with both on-ground test data and, more importantly, with inflight data, predicting the spacecraft pointing performance within 5% error, for ESA missions including Meteosat Third Generation (MTG), Sentinel-2, MetOp Second Generation and EarthCARE.

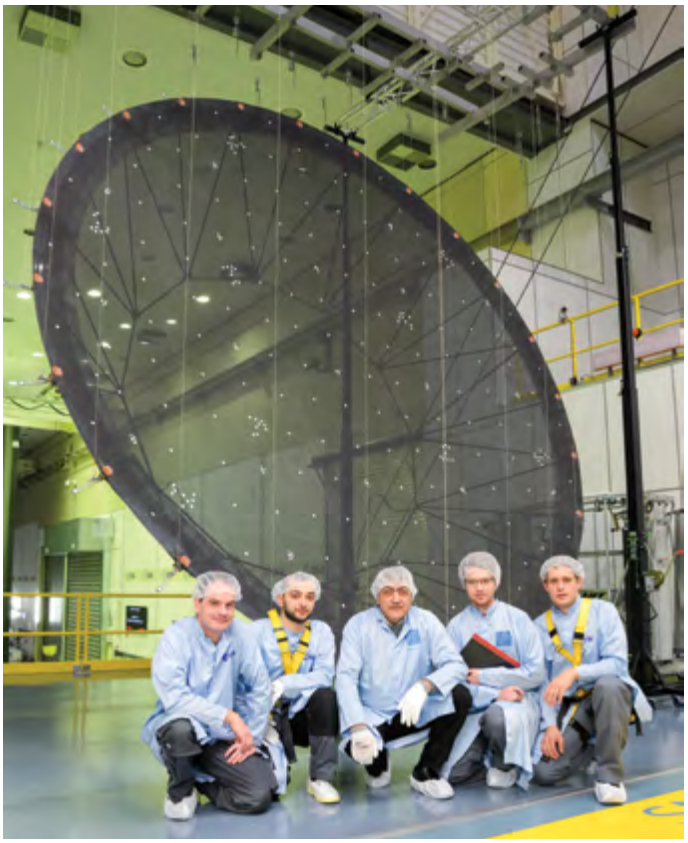
Another Technology Research Programme (TRP) activity demonstrated the technological readiness of thin shell-membranes. These provide high thermoelastic stability for large deployable apertures (antennas and radio telescopes), can be folded to small volumes and provide the required RF performance (including passive intermodulation).



***LABUM** 5 m aperture demonstrator entering the Large Space Simulator*

The 5 m aperture demonstrator was tested in the Large Space Simulator (LSS) at ESA's ESTEC Test Centre and showed excellent stability performance under cold and hot thermal cases, as well as sharp thermal gradients generated by the Sun illumination system of the LSS. A stability of less than 0.3 mm of surface deformation was measured all over the 5 m surface when exposed to thermal gradients in excess of 100K.

This technology has thus become available mainly for Large Deployable Antennas as a fully European alternative to existing US products. The prime contractor is the Technical University of Munich Institute for Lightweight Structures (LLB), with HPS GmbH as subcontractor.



***Members of the LABUM** test team with the reflector*

Technology is also a key element of competitiveness, and thus in ensuring the continued viability of Europe's space industry. It also constitutes Europe's main source of new jobs from the space sector with novel technologies opening up fresh markets and enabling innovative applications.

The Directorate oversees a set of R&D programmes aimed at sourcing innovation beyond the immediate horizon of the markets while serving to 'de-risk' the process of innovation for industry. The reach of these programmes extends far beyond the main industrial prime contractors and system integrators: notably the TRP and GSTP boast among the largest participation of SMEs of all ESA activities.

In addition, the Directorate's coordination of European standardisation efforts boosts industrial cost-effectiveness and the general technical state of the art while also levelling the playing field for smaller companies, opening up new opportunities to compete based on standardised working and interfaces.

Technology programmes

Technology and technical activities

The long-running TRP remains ESA's innovation mechanism to serve all programme domains in the area of lower technology readiness level. The TRP Innovation Triangle Initiative (ITI) supports the identification, validation and development of disruptive innovations that demonstrate the potential to address space problems. ITI and the Network/Partnering Initiative (NPI) give preference to innovations coming originally from non-space industrial or research sectors. The objective of both initiatives is to combine the creativity, knowhow and experience of the research community, space customers and industry. Proposals were provided by European industry and academia during 2015 through both schemes leading to interesting new projects.

In 2015, some 130 activities from TRP Work Plans were contracted and 111 were finalised. While the implementation of the second year of Work Plan 2014/15 was ongoing, the outline for Work Plan 2016/17 was presented to ESA's boards. TRP Work Plan 2016/17 has been prepared based on ESA's Technology Strategy and Harmonisation Roadmaps and has been aligned to programmatic decisions.

In detail, the objectives set for the years 2016/17 are to:
- maintain critical competence in applications, with a focus on preparing future navigation technologies;
- foster cross-cutting initiatives and collaborative activities in the domain of generic technologies; a new cross-sectorial line, Advanced Manufacturing Technologies for space has been added to the generic domain;
- maintain the central role of scientific activities;
- prepare for exploration through supporting updated Exploration Technology Roadmaps.

The first year of the TRP Work Plan 2016/17 has been approved by ESA's boards. The second year will be finalised with a focus on exploration in order to support the updated Exploration Technology Roadmaps. In order to foster synergy, the TRP Work Plan has been prepared in conjunction with the ARTES 5.1 Call For Ideas and with the GSTP compendium update.

The GSTP is a natural follow-on to the TRP, bringing technology developments further up the Technology Readiness Level ladder. A key action in 2015 for GSTP was the updating of the GSTP Compendium of Potential Activities. The proposed activities are ready to implement and aim at enhancing technologies and techniques that are generic to all applications domains as well as those that are targeting specific domains such as Earth Observation and Space Transportation. In addition, a Compendium of Potential Activities dedicated to Advanced Manufacturing was also published for the first time, providing a comprehensive set of 35 activities to help mature key aspects (materials processing, shaping, surface engineering, joining and assembly) and to create benefits in terms of design freedom, performance, cost and lead time reduction.

GSTP, in its 22nd year of implementation, continues to attract ever-growing interest. Contributions to the programme have increased steadily to beyond the €600 million level for GSTP's sixth period (GSTP-6).

The year witnessed the initiation of 100 new activities, addressing topics such as Filament Winding of Titanium Silicon Carbides (TISIC) or developing Short Wave Infrared (SWIR) detectors, while 85 were finalised, including activities related to GAMIR, a new-generation GNSS receiver for future ESA missions that exploits the potential of GPS and Galileo systems for space on-board navigation and for a wide variety of remote-sensing applications.

In the context of GSTP Element 1 Core technology activities for projects and industry, key milestones were achieved for several projects. The first step of the European Ground System Common Core Phase-C/D (the initial software release) was completed and the second step was initiated, with the aim of completing the full development. Technology activities were also initiated in relation to Cheops, IASI-NG (MetOp-SG) as the instrument-related developments for the next generation of gravity gradient missions. Phase-B1 for the Active Debris Removal mission was implemented.

GSTP Element 2, the permanently open invitation to tender aimed at fostering competitiveness on market-oriented activities, saw a continuous flow of two to three new proposals per month in 2015. Proposals pertained to products covering systems, software, equipment such as TT&C (telemetry, tracking and command) transponders, and building blocks such as point-of-load converters.

Advanced research projects from the Advanced Concepts Team (ACT) in cooperation with European universities in 2015 included solar rectennas and photon-enhanced thermionic emission systems as new power generation systems for space applications, space-borne femtosecond laser filamentation as a new remote-sensing tool for atmospheric spectroscopy, microwave drilling, tendril-based climbing plants for bio-inspired robotic systems, sleep and hibernation research for deep-space missions, machine learning, social and hybrid insect-inspired multi-robot exploration, silk-based biomimetic sensing through changes in structural proteins, and optimal real-time landing using deep networks.

Based on an internal call for ideas, new interdisciplinary studies were implemented together with industry, R&D organisations and academia addressing new concepts for space applications from advances in technology and changes in needs and markets, paradigm changes that would enable entirely new ways of designing or using space systems, and space activities addressing global challenges such as climate change, energy and health in a new and interdisciplinary manner (with synergies across ESA and national programmes). Some notable areas for new activities related to novel Earth-monitoring techniques for pollutants and climate change applications, advanced AI-based algorithms for marine safety operations, and new operation techniques for future exploration missions.

Early phase mission studies (defined by the different directorates) conducted in 2015, and also containing the preparation of new programme proposals for the Ministerial Council 2016, included the three M4 Science mission Phase-A/B1 studies of XIPE, ARIEL and THOR, the Phase-1 Lunar Polar Sample Return study, the Asteroid Impact Mission (AIM) Phase-A/B1, the Phobos Sample Return Phase-A/B1, and the Athena Phase-A System Study for a large X-ray telescope, all with two parallel studies.

Two studies for joint missions with China, GLOBAL-V (a collaboration between Belgium and China, RADI/SAST), and SMILE (a collaboration between ESA and China), have been performed with good results being obtained.

Clean Space

Implementation of the Clean Space initiative continued. Major milestones were the start of the system activities of the CleanSat initiative to develop new Clean Space-compliant products.

The three contracts with the Large System Integrators on debris mitigation technologies were completed. A list of prioritised building blocks is now available, enabling the development of the technologies that will lead to products.

The e.Deorbit mission Phase-B1 activities (two parallel industrial activities) have been concluded and will proceed with a B2 bridging phase until the Ministerial Council 2016. The e.Deorbit mission will be the first mission for the demonstration of active debris removal technologies and techniques.

Advanced manufacturing

The Advanced Manufacturing Cross-Cutting Initiative is aimed at consolidating European leadership in advanced materials and manufacturing for space applications. The current European technology and industrial ecosystem offers ideal opportunities to spin in digital manufacturing technologies and Industry 4.0 to space and to establish novel qualified production capabilities fostering European space industry competitiveness.

Following intensive stakeholder consultation, the GSTP-6 Element 1 Compendium of Potential Advanced Manufacturing activities (reference TEC-T/2015-013/NP Rev. 2) was presented to the delegations of the GSTP-6 Participating States and their firms in November 2015.

The initiative has attracted wide support from European industry and institutions: as of today, 181 formal expressions of

interests valued at in excess of €150 million have been received from 46 firms representing 15 Member States.

Furthermore, ESA has set up the ESA/RAL Advanced Manufacturing Laboratory in Harwell serving all European stakeholders in identifying and validating disruptive advanced manufacturing technologies and accelerating their adoption for spaceflight opportunities.

Technology demonstration projects

Proba-1 and Proba-2 have completed 14 and six years in orbit respectively, and will continue to be operated under the Earth Observation third party programme and Space Situational Awareness.

Proba-V has completed its nominal lifetime of 2.5 years and an extended lifetime of up to five years has been entered, operated by Earth Observation. It is delivering a new vegetation product at 100 m resolution.

GSTP Element 3, known as Technology Flight Opportunities, aims to make opportunities available for in-orbit demonstration of technologies. A key event for GSTP 6-3 was the launch of the GOMX-3a secondary payload on JAXA's HTV-5 service mission in August 2015. The GOMX-3 mission aims to demonstrate new capabilities of nanosatellites focusing on attitude control, RF sensing and high-speed data downlink. Another key highlight was the initiation of OPS-SAT. The activity aims to kick-start innovation and break the 'has never flown, will never fly' cycle in satellite control. More than 100 companies and institutions from 17 European countries have registered experimental proposals to fly.

In the context of the final GSTP Element related to 'breakthrough missions', the Proba-3 mission is advancing. Phase-C/D of this precision formation-flying mission was initiated and progress is being made on the mission (including the ground segment), the science and the associated payload development. Studies were also ongoing in 2015 in order to prepare future demonstration missions, including the Active Debris Removal, the e.Deorbit mission and AIM. This mission intends to demonstrate technologies for small science and exploration missions, with an emphasis on deep-space communications. Previously launched in-orbit demonstration missions (Proba-1, Proba-2 and Proba-V) are continuing to deliver data for their respective user needs.

On a final note, the ESA Space Technology Workshop is being organised to focus on research and development of space mission enablers and to bring together key stakeholders involved in technology management including ESA Member State delegates, European industry and ESA colleagues and to foster the dissemination of R&D achievements to a wide audience.

A mission for the demonstration of a 'mini' Hall effect thruster has been initiated based on the platform developed in the frame of the European Student Earth Orbiter education project.

AIM is an innovative interdisciplinary mission of opportunity to demonstrate new technologies for future deep-space missions while addressing planetary defence objectives and performing, for the first time, detailed investigations of a binary asteroid system. AIM is part of the Asteroid Impact and Deflection Assessment (AIDA) international cooperation with NASA.

In order to maintain a schedule compatible with the optimal launch window in October/November 2020 as determined by the target asteroid's close encounter with Earth in 2022, two parallel industrial Phase-AB1 studies have been started. In addition, associated technology preparation and science definition have been conducted in a novel integrated manner with industry benefiting from many of the lessons learned from the Rosetta mission. The results will be fed into a mission proposal that will be put forward at the Ministerial Council 2016. In parallel, NASA has carried out similar studies on the DART spacecraft. An international asteroid science investigation team has been put in place.

A European Commission (Horizon 2020) workshop on In-orbit Demonstration (IOD) was held at ESTEC to present the overall IOD landscape within ESA and the Commission and prepare for the content of the European Commission IOD programme that will start in 2017.

Technology transfer

The community of ESA Business Incubation Centres (BICs) continued to grow. By the end of 2015, 12 BICs were in operation. Earth Observation complements the offer of the ESA BICs to foster the deal-flow related to Earth Observation/Copernicus business cases and increase application cases for the ESA BICs.

Engineering support and testing

The Directorate's engineers have continued to support ESA projects lending engineering support to launches such as those planned for the Galileo constellation in 2016. Major milestones were passed in preparing the launch of the ExoMars 2016 mission.

A large number of tests, many of them long-duration were performed to support space hardware development, notably on new technology for mirrors, life test qualification of the Laser Communication Terminal Coarse Pointing Assembly, the NOMAD flip mirror for ExoMars, and NAVANT antenna patches for Galileo. For the latter, the GN2 (gaseous nitrogen) facility enabled a very large number (1600) of thermal cycles in a short time to expedite the first Galileo Full Operational Capability (FOC) launch. The Fast Thermal Vacuum facility was used intensively for the thermal testing of the BepiColombo and Solar Orbiter coating up to 550 °C, performing a large number of cycles in a limited period. Many of these tests have been performed using in-house accredited ISO 17025 test methods.

A major highlight of the year was the successful BepiColombo Mercury Planet Orbiter thermal test to verify the overall thermal performance of the spacecraft and to validate the updates implemented subsequent to the Structural and Thermal Model test, in particular changes to the multilayer insulation and reworking of the heat pipe network.

In addition to these space programme tests, the Test Centre was also used for a number of distinct tests for non-space programmes. In particular, the 'six degrees of freedom' capabilities of the HYDRA multi-axis shaker were used to simulate transport and seismic loads for the verification of large electrical transformers.

Maintaining the reliable status of the Test Centre facilities is a priority and is achieved through the year by in-house engineering and industry support.

Europe's BepiColombo Mercury Planetary Orbiter *seen atop its carrier vehicle, the Mercury Transfer Module, at ESTEC in 2015*

Ensuring quality

The year concluded for the European Test Centre Certification Scheme with the renewal of certification for major European test centres, such as the ESTEC Test Centre, and Intespace in Toulouse. Moreover, annual surveillance assessments were also performed on other certified test centres to ensure continuing compliance with ECSS requirements.

The ESA Non-conformance Tracking System (NCTS), first released in 2005, has been used regularly for more than 10 years in supporting ESA projects to manage non-conformances (NCs) in an effective manner. NCTS enables visibility of NCs among all partners within a given project, as well as embedding the workflow for management of NCs. In 2015, the last version of the system was developed, in accordance with user requests, to enhance system functionalities. The number of projects adopting it increased still further in 2015, as did the number of registered users. Major projects such as Galileo, BepiColombo and all the Sentinels have been using the software since their inception, while other high-profile missions such as Meteosat Third Generation, the Proba series and ExoMars have also adopted NCTS in recent years.


esa
European Space Agency

resources management, corporate activities & external relations

The formal opening of the Roy Gibson Building at ECSAT, UK, on 9 July 2015

Human Resources, Facility Management & Informatics

Human Resources policy and operations

In 2015, the Human Resources Department finalised the conceptual phase of new HR processes and tools and began their implementation: the pilot phase for the mentoring scheme for newcomers was successfully delivered while the Job Family Framework and new ESA Competency Framework were finalised and integrated into competency planning, recruitment and training processes. An Individual Development Process was rolled out to help staff identifying future career steps and a Leadership Competency Assessment – consisting of a personality inventory and a leadership style test – introduced to better assess candidates' leadership competencies when applying to managerial positions.

The HR Management System Evolution Project was launched, with the support of the IT Department. The aim of the project is to replace outdated IT applications and increase efficiency by rationalising and harmonising procedures while providing full visibility and transparency towards staff and managers.

Learning and Competency Development

Under the newly created HR Competence and Policy Centre, different types of activities were conducted in 2015, from the implementation of a large range of training courses and programmes to the introduction of new measures aimed at further supporting competency development across the Agency.

The ESA Learning and Development portfolio covers fundamental knowledge and skills supporting both organisational and individual needs at ESA: Business Efficiency and Personal Development, ESA Environment, Leadership and People Management and Technical and Project Management. A review of this portfolio has been started to analyse in particular to what extent the current training offer matches the new ESA Competency Framework.

Young Graduate Trainee & Internal Research Fellow Programmes

The ESA Young Graduate Trainee (YGT) programme provides hands-on experience to young graduates from ESA Member States and Cooperating States. In 2015, out of the 3879 applicants to the YGT Programme, 69 candidates from 21 different nationalities received an offer following their interviews. In total, 137 YGTs were in post at ESA during the year.

The Internal Research Fellow Programme offers scientists and engineers the opportunity to carry out advanced research in a variety of disciplines related to space science, space applications

and space technology. In 2015, the Internal Research Fellow Programme welcomed 29 new recruits from 13 different nationalities. In total, 70 Postdoctoral Research Fellows were in post at ESA during the year.

National Trainee programmes

The National Trainee programmes for Germany, Luxembourg, Belgium, Portugal and Switzerland continued their activities during 2015.

Statistics

Staff

At the end of 2015, the Agency had 2266 staff in post, compared with 2233 at the end of 2014. There were 108 external recruitments in 2015.

Pensions

At the end of 2015 there were 1398 pension recipients, compared with 1341 at the end of 2014.

Member States	Hors Classe	A	L	B	C	Total Staff
Austria		38	1	2		41
Belgium	1	94		5		100
Czech Republic		5				5
Denmark		14				14
Finland		17		4		21
France	2	414	8	74	4	502
Germany	4	386	5	45		440
Greece		18		2		20
Ireland		21		7		28
Italy	2	394		23		419
Luxembourg		2				2
The Netherlands	1	65		14		80
Norway		22		2		24
Poland		10				10
Portugal		25		2		27
Romania		2		1		3
Spain	1	197		4		202
Sweden		41		2		43
Switzerland		26		2		28
United Kingdom		213	3	17		233
Total	**11**	**2004**	**17**	**206**	**4**	**2242**
Non-Member States						
Canada		23		1		24
Total		23		1		24
Grand Total	**11**	**2027**	**17**	**207**	**4**	**2266**

ESA staffing *as at 31 December 2015*

Estates & Facilities Management

ESA's Estates and Facilities Management Department's primary function is to provide the technical and office environment to enable ESA's core business to operate in an efficient, economical and sustainable manner. It has put in place a suite of metrics that are designed to ensure that this is achieved. Key Performance Indicators measure the department's outputs across ESA's main sites; key internal benchmarks incorporating weighted square metres and purchasing power parity and interaction with external benchmarks drive value for money within geographically and functionally diverse sites; while close cooperation with ESA's Sustainable Development Office, targeted investment and a continuous improvement programme ensures that ESA remains fully on track for Europe's '20-20-20' target (20% increase in energy efficiency, 20% reduction in CO_2 emissions, and 20% renewables by the year 2020).

The department performed a wide range of engineering tasks supporting ESA's main sites. The L'Aquila earthquake of 2009 and the consequent Italian legislation of 2012 meant that a complex process of implementing anti-seismic measures in all of ESRIN's legacy real estate had to be undertaken by the site's civil engineering specialists. Analysis was conducted across the site revealing a wide variation in construction methods and materials. Computer modelling was employed as a key means of identifying the necessary adaptations, followed by a rigorous implementation programme. The process is continuing but major progress has already been achieved, guaranteeing far higher protection levels.

The department was also leading the project to construct the Roy Gibson Building at the European Centre for Space Applications and Telecommunications (ECSAT) in the UK. The building, formally opened on 9 July by Roy Gibson himself, ESA's first Director General, contains many features designed to reduce its carbon footprint and operating costs. These include geothermal heat-pumping, a green roof and a multitude of devices that have led to a BREEAM 'excellent' certification. ECSAT joins ESA's team at the European Astronaut Centre in Cologne and the EGNOS and Neosat teams in Toulouse in being located on campuses run by host nation entities, a model that is significantly different to the ESA-operated sites.

Information Technology

In 2015, the IT Department embraced its role as an agent for change within the Agency. Major achievements included introducing new service providers, innovative technology releases, a wider collaboration network, the release of important new software options for ESA and stronger contract negotiations with existing suppliers. The IT Department remains committed to sourcing and providing the best IT tools for ESA in a competitive technology market.

The new communications service provider consortium started their contract on 1 October. The new contract provides a wider range of services to the Agency than ever before including significant bandwidth improvements for all major sites. These upgrades have improved ESA's overall networking power, one example being the small sites upgrade that raised bandwidth from 4 MB/s to 30 MB/s.

The IT Department renegotiated its contracts with several other suppliers for telecommunications, software and services. Negotiations were focused on providing better services for ESA under efficient contracts. Several sites, for example, had their mobile contracts renewed with local providers, increasing mobile internet capabilities and introducing more smartphone options.

The European Centre for Space Applications and Telecommunications (ECSAT) *is ESA's facility in the UK, based at Harwell in Oxfordshire*

ESA's private cloud computing options attracted more internal directorate customers in 2015. The fully redundant cloud computing system is located across two geographical locations and provides state-of-the-art systems tailored to ESA. The cloud also made virtualisation for essential programs possible, with work ongoing throughout the year to provide fully redundant, networked access to essential ESA online services.

The IT Department also released new products for document management, e-tendering, e-management and industrial policy management.

Operational IT has been crucial to supporting ESA's many launches and space activities in 2015. LISA Pathfinder, MSG-4, Sentinel, IXV and multiple Galileo Full Operational Capability launches were all supported. These launches greatly benefit from the on-hand dedicated support of the IT Department teams.

In 2015, esaconnect service subscriptions increased as users began to explore their online collaboration options. This service also went live for external customers in 2015, improving working partnerships between ESA and industry.

Procurement, Financial Operations & Legal Affairs

Industrial Policy

Following a Council decision in 2013 to discontinue the cumulative geographical return statistics of the Agency by the end of 2014 and setting a lower limit of 0.96 for each Member State, the Industrial Policy Committee confirmed during its March meeting that the conditions for the discontinuation of the statistics had been fully met, with all relevant Member States having achieved a return coefficient equal to or higher than 0.98.

As from 2015, the Agency entered a new period of industrial return statistics based on a domain structure with a lower return coefficient limit of 0.90. With the start of the new period, a new industrial return statistics tool (EROS) was introduced at the end of 2015, allowing for up-to-date quarterly reporting of the statistics from the first quarter of 2016.

The 2015 High Level Forum with Industry (HLF) took place on 2 June in ESTEC. An impressive level of participation confirmed the interest in preserving this key channel for dialogue between ESA, European industry and institutions. A round table on 'the short- and medium-term implementation perspectives with respect to the 2014 HLF recommended actions' was organised, and concluded with recommendations on processes ensuring that all firms have a fair chance to participate in ESA programmes, on use of space assets, and new business models. A debate about Public–Private Partnerships (PPPs) concluded by recommending a stepped dialogue between industry and institutions, to define ad hoc case-by-case partnership conditions and to secure their success.

Stemming from the Poland Accession Agreement, a mid-term review of progress in the implementation of the Polish industry incentive scheme covering the 2013–17 period was conducted in 2015. The review consisted of a thorough analysis of space activities among Polish firms as well as an analysis of their industrial potential and weaknesses. The results of the analysis and the associated recommendations were endorsed by the Polish/ESA Task Force and presented in Warsaw in May. The analysis highlighted good progress in the integration of Polish firms in the European space supply chain, corresponding to the current level of the Polish contribution to ESA programmes and taking into consideration the short time since Polish accession to ESA. The mid-term review led to six recommendations: improve the industry–academia relationship; foster the arrival of capital investment in space activities by formulating a national space strategy; extend until 2019 the industry incentive scheme; and change priority in financing downstream activities and provide space market training opportunities). All six recommendations have been taken into account and are being implemented.

Procurement

Time to contract

Express Procurement or 'EXPRO', the streamlined procedure put in place by the Procurement Department in 2014 in an effort to reduce drastically time-to-contract for procurement actions in the low- to medium-value range, is showing its beneficial effects.

With a general time-to-contract average of 2.6 months (2015), EXPRO has met and exceeded the original objective, set for all ESA procurement actions (i.e. not only for EXPRO), to go from an average of 7.8 months (2013) to 5 months.

Based on the above very encouraging results, the IPC has authorised the Executive to extend the EXPRO trial phase as needed while the appropriate steps are put in place to make EXPRO part of the official ESA regulatory framework for procurement.

eTendering / Entity Management

The 'e-Tendering' and 'Entity Management' projects were started in 2014 in order to, respectively:

- fully automate the Agency's tendering process by adding to the existing IT infrastructure covering outbound information (including tender actions, clarification, communications to bidders and support documentation), i.e. the EMITS system, a new segment covering inbound information (including proposals, requests for clarification, communications from bidders). The new system also offers a number of ancillary

functions in support to specific parts of the procurement process such as tender opening, tender evaluation and drafting of reports.
- replace the industry Outlook registration system for ESA's industrial partners with a new one offering, among other things, a comparatively user-friendly, two-step registration procedure and a single database interfacing with ESA's other corporate systems.

The phases for Design (started in December 2014), Build and Integration (the latter including In-House Testing) of the eTendering project continued throughout the year, with the Integration part being completed in November. Due to the initial lack of funding, the Design phase for the 'Entity Management' part could only start in April, but it was eventually possible to complete the Integration phase in mid-December. The completion of the Integration and In-House Testing phase for both project threads before the end of the year will allow, subject to a successful User Acceptance Testing, the timely deployment of the system by March 2016 as planned.

Ariane 6 and Vega C contracts signed on 12 August

Eight months after the ESA Ministerial Council in December 2014, approving measures to improve the competitiveness of the European launcher sector, ESA signed contracts for the development of the Ariane 6 new-generation launcher, its launch base and the Vega C evolution of the current small launcher with the common element of the new solid-rocket motor P120C on 12 August. The Ariane 6 launcher development contract with Airbus Safran Launchers SAS, a joint venture between launcher manufacturer Airbus and engine maker Safran (Snecma), is valued at €2.4 billion, including a first flight in 2020.

The second contract is with ELV, a joint public–private company of the Italian Avio Group and the Italian space agency ASI, which will lead the development of the upgraded Vega C rocket. The contract value is €395 million. Vega will be used for low Earth orbit missions, such as Earth observation, science and technology demonstration missions. The inaugural flight is planned for 2018.

The third contract is between ESA and the French space agency CNES for the development of the Ariane 6 launch pad and integration facilities at Europe's Spaceport in Kourou, French Guiana. The contract value is €600 million and covers the cost of a new launch base for Ariane 6. The formal handover of the facility by CNES to ESA is planned for late 2019.

ESA signed contracts for the development of the Ariane 6 new-generation launcher, *its launch base and the Vega C evolution on 12 August 2015. From left, Alain Charmeau, CEO/President of ASL; Pierluigi Pirrelli, CEO of ELV; Jan Woerner, ESA Director General; Gaele Winters, ESA's Director of Launchers; and Jean-Yves Le Gall, President of CNES*

According to ESA Director General Jan Woerner, these contracts 'will allow the development of a family of European launchers, highly competitive in the world market and ensuring autonomous access to space at fully competitive prices for ESA's Member States'.

Finance, Planning & Control Operations

Financial Operations

Intense effort has been devoted to certifying the accounts and focusing on the accounting dimension of the Agency's payments. This entailed the analysis, validation and approval of all payments to suppliers, representing approximately 40 000 transactions related to payments and 35 000 mission settlements.

A third 'procure-to-pay' workshop was held to identify improvements to ease payment to suppliers while ensuring full compliance with accounting standards, thereby improving the efficiency of payment operations. Senior staff from Finance, Procurement and Programmes were involved. The concrete result was the publication of an administrative instruction on Corporate Policy on the drafting, implementation and execution of financial and payments-related clauses in ESA contracts. These principles will be subject to a wide awareness campaign on all ESA sites.

An innovative training programme was trialled with a few suppliers in a pilot webinar session on 'How to navigate the esa-p system'. It is intended to offer this training to both internal and external participants.

Corporate Controlling

Corporate planning and control played a crucial role in 2015 in proposing budgets that were commensurate with cost plans approved by the Programme Boards, taking into account the funding capacity of Member States, ensuring balance between cash outflows and available resources and removing the need to call for loans.

In particular, following the decisions made in the Ministerial Council in 2014, significant effort was devoted to ensuring the financial sustainability of the Agency, on the one hand by working with several Member States in securing an adequate level of contributions, and on the other hand by optimising disbursement plans and continuously monitoring procurements of programmes and activities.

The multiyear planning process allowed the Executive properly to plan and monitor resources and the progress of programmes, projects and activities, and take appropriate action in the event of significant deviation from plans.

Cost

The Agency's total cost in 2015 amounted to €4262 million (€3510 million relating to ESA programmes and activities, €752 million to third-party activities.)

Mandatory Activities represented 17% (€728 million) whereas 58% was on Optional Programmes (€2472 million), 2% on activities associated to the General Budget (€106 million), 18% on programmes financed by third parties (€752 million) and 5% others (€204 million).

The core elements of the Agency's Mandatory Activities are the Scientific Programme and Basic Activities including, among other things, the General Studies Programme, Core Technical Expertise, Investments, Technology Research Programme, Earthnet and Long-Term Data Preservation. In 2015, the Scientific Programme cost €494 million (12% of total). The main activities were the successful launch of LISA Pathfinder in December, Rosetta operations, and the development of BepiColombo, Solar Orbiter, the James Webb Space Telescope, Euclid and JUICE as well as preparation of future missions.

The execution of programmes including the study, development, launch and operations of satellites as well as the development, exploitation and maintenance of launchers and other space systems is implemented via the Agency's Optional Programmes in which States participate with a voluntary subscription.

In 2015, €757 million, or 18% of total Agency cost, was incurred on Launcher Programmes (excluding the Guiana Space Centre). In launcher development, the Phase-A/B activities for the Ariane 6 Launcher system, P120C and Launch Base are all progressing rapidly together with industry in implementing decisions taken at the 2014 Ministerial Council. In Ariane exploitation, five successful launches of Ariane 5 were supported. Further, activities for Vega C development are progressing as planned. Vega exploitation accompanied three successful Vega launches delivering all ESA payloads into their planned orbits. In February, the Intermediate eXperimental Vehicle was launched on a Vega rocket, pioneering critical systems and technologies necessary for a return from low Earth Orbit. The Future Launchers Preparatory Programme (FLPP) continues to work on various technologies and integrated Demonstrators according to its objectives.

Earth Observation optional programmes accounted for 16% of ESA cost, with €689 million accrued. Sentinel-2A was launched on 23 June 2015, and an in-orbit commissioning review completed on 15 October. A Draft Implementing Arrangement between ESA and Eumetsat concerning cooperation on Jason-CS was approved in November 2015.

Cost in 2015 covered the development of the Sentinels under the GMES Space Component Programme, the meteorology satellites with Meteosat Third Generation and activities for MetOp Second Generation, and the development of EarthCARE and ADM-Aeolus within the family of Earth Explorer missions.

Cost for Human Spaceflight, Microgravity and Transportation, amounting to €345 million (8% of total ESA cost), relates mainly to the exploitation and utilisation of the International Space Station.

In Telecommunications, which represented 6% (€268 million) of the total ESA cost, the main areas were the European Data Relay System programme, while telecommunication technology activities and the Integrated Applications Promotion programme continued to grow in 2015.

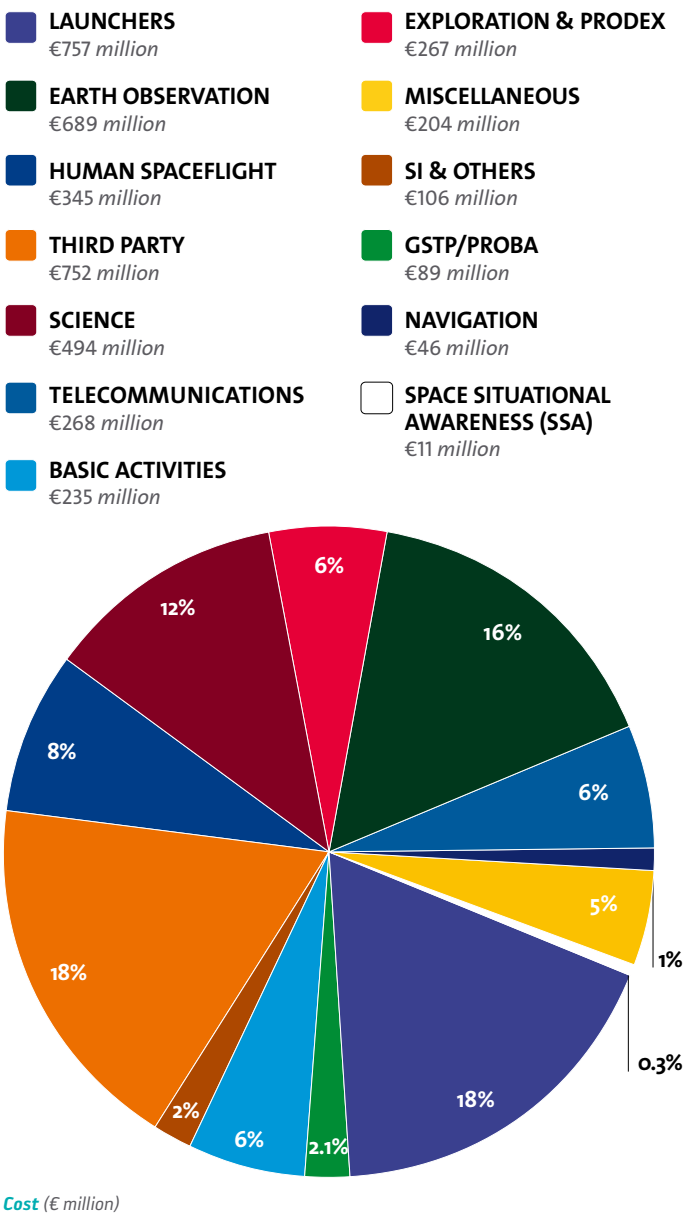
Robotic Exploration and PRODEX cost of €267 million corresponds to 6% of total ESA cost, mainly due to ExoMars full development, in parallel, of the 2016 and 2018 missions.

The General Support Technology Programme, including Proba-3, Proba-V and In-Orbit Demonstration Missions, covered 2% of total ESA cost (€89 million).

Optional Navigation Programmes represented 1% of ESA total cost (€46 million) mainly covering the GNSS Evolution Programme.

In the Space Situational Awareness Programme, cost amounted to €11 million (0.3% of total ESA cost). Contracts for the Space Weather Monitoring System and Expert Service Centre have got under way.

For Third Party activities, cost of €752 million (18%) includes €491 million for navigation-related activities funded by the European Commission through Delegation Agreements for Galileo and EGNOS Exploitation. In July, the Working Arrangement between ESA and the Commission was signed on the future implementation of the EGNOS Programme with the maximum budget envelope set to be €700 million until 2021. For Full Operational Capability (FOC)



Cost (€ million)

Deployment Completion, activities in 2015 focused on the launches of satellites 7–12 (GSAT203/204/205/206/208/209) as well as the preparation of the FOC satellite operations and ground system verification activities.

In Earth Observation, cost of €196 million relating to Third Party activities was mainly on cooperation with Eumetsat on Meteosat Third Generation (MTG), Meteosat Second Generation (MSG) and MetOp and with the European Commission on Copernicus.

Approximately 82.5% of the Agency's 2015 cost was accrued on contracts in Member States for research or project-related activities, the running of technical or operational facilities, and financing capital cost and industrial development. The remaining 17.5% covered operating

Income

ESA Mandatory Activities (including the General Budget and Scientific Programme) as well as activities associated with the General Budget are financed by Member States' contributions. The ESA Convention dictates that the Agency's Mandatory Programmes are to be financed using a contribution scale based on the national income of the Member States over the last three years for which statistics are available.

ESA Optional Programmes are financed by Member States' contributions and, for some programmes, by other funding entities, one of which is the European Union. The Participating States declare a voluntary subscription on a multi-annual basis.

Third Party programmes are managed by ESA but totally financed by third parties. In 2015, they represented 26% of total ESA income.

Contributions for 2015 from States to the Agency's Mandatory Activities and Optional Programmes as well as associated budgets are indicated in the following table.

	2015	
	Mandatory Activities	**Optional Programmes**
Austria	2.21%	1.49%
Belgium	2.74%	6.44%
Czech Republic	1.01%	0.25%
Denmark	1.78%	0.51%
Estonia	0.11%	0.01
Finland	1.38%	0.35%
France	15.16%	23.05%
Germany	20.42%	28.27%
Greece	1.46%	0.04%
Hungary	0.63%	0.09%
Ireland	1.04%	0.39%
Italy	11.03%	14.76%
Luxembourg	0.19%	0.82%
Netherlands	4.53%	1.55%
Norway	2.81%	1.47%
Poland	2.74%	0.71%
Portugal	1.15%	0.31%
Romania	0.90%	0.83%
Spain	7.81%	2.78%
Sweden	2.82%	2.25%
Switzerland	3.87%	4.04%
United Kingdom	14.21%	8.97%
Total MS	**100%**	**99.40%**
Canada	4.38%	0.45%
Latvia		0.05%
Lithuania		0.05%
Slovenia		0.05%
Total Cooperating	**4.38%**	**0.60%**
ESA	**104.38%**	**100%**

Contributions for 2015 *from Member States to the Agency's Mandatory Activities and Optional Programmes*

Long-Term Planning and Performance Management

In 2015, corporate strategic planning was focused on consolidating decisions taken during the Council meeting at ministerial level in Luxembourg at the end of 2014 and started the preparatory activities in view of the next Ministerial Council planned for December 2016. On the one hand, efforts were made to consolidate the planning of recently approved optional programmes in order to ensure the sustainable implementation of decisions taken at the 2014 Ministerial Council, while on the other hand, initial activities aiming at identifying candidate programmes to be submitted at 2016 Ministerial Council got under way. The 2016–25 ESA Long-Term Plan (LTP) was prepared and was submitted to Council in support to the approval of 2016 budgets in December 2015. As usual, in the year preceding the Ministerial Council, the LTP only provided indicative information about programmes and activities planned for submission to ministers for subscription.

At the same time, the revision of the ESA Strategy Map was initiated in 2015 through two workshops of the Networks of Strategic and Risk Coordinators of all ESA directorates. Their purpose was to consolidate drivers to change and identify strategic objectives, actions and associated risks. Based on the outcome of the workshops and further consultations within the Executive as well as with Delegations and important space community stakeholders in Europe, the revision of the ESA Strategy Map and, as a consequence, of the relevant key performance indicators measuring the Agency's performance, will be finalised in the course of 2016, taking into account decisions made at the Ministerial Council.

Corporate Risk Management

The Agency-level Risk Management Framework supporting the strategic planning and decision-making process is in its fourth year of operation. The Network of Risk Coordinators participated actively in the Risk Management process identifying risks to the Agency's strategic objectives and proposing mitigation actions to be implemented and monitored. A report on the major risks to the Agency was presented at the June Council meeting.

A major success in 2015 was the ESA-led initiative to exchange best practices within the Enterprise Risk Management International Network (ERMINe) forum that took place in June, gathering large private and public high-tech organisations from all over the world.

ESA has thus become apprised of some of the latest practices in the governance of risks, drawing inspiration from best practices in other organisations, and is in the process of implementing them.

Legal Services

In 2015, the ESA Council revised a number of ESA rules and regulations, most notably:

- the ESA Procurement Regulations (ESA/REG/001, rev. 4);
- Annex I to the ESA General Clauses and Conditions for ESA Contracts (ESA/REG/002, rev.2);
- the ESA Security Regulations (ESA/REG/004, rev. 1); and
- the industrial policy rules concerning the calculation of the geographical return coefficients and on the publication of corresponding statistics and forecasts, succeeding the 1998 Regulation (ESA/REG/009).

A complete set of ESA Regulations is available on the 'Law at ESA' pages of the ESA website.

Furthermore, 21 agreements were concluded with ESA partners (see list in the Annex), including two accessions agreements to the ESA Convention, signed respectively with:

- Estonia on 4 February 2015, becoming the 21st Member State of the Agency as from 1 September 2015; and
- Hungary on 24 February 2015, becoming the 22nd Member State of the Agency as from 4 November 2015.

External Relations

Relations with Member States

ESA, as an intergovernmental organisation, pursues the collective interest of its Member States. With 22 Member States in 2015, understanding the drivers and stances of those individual Member States is key and requires regular follow-up and careful consideration. Throughout the year, the Office for Coordination with Member States has fulfilled this role and facilitated a two-way exchange between the Executive on the one hand, and Member States and their delegations on the other, in particular by consultations in support of the ensuing decision-making process. Leveraging the insights thus acquired, there was also continuous close interaction with individual delegations on specific matters such as governance and national strategies.

The Department for Relations with Member States facilitated two events organised by the Spanish Presidency of the European Interparliamentary Space Conference (EISC) under the theme 'Governance of the Space Sector at National Level'. A workshop was held on 23–24 March in Madrid and a plenary session on 21–22 September. The Presidency intended to provide a platform of exchange to bring about a common understanding on space strategies and priorities in Europe. The conference brought together representatives from the various stakeholders. A number of topics were covered including space governance in Europe, industrial and data policy, and European and national legislation related to space.

2015 also saw the third edition of the ESA/EISC Space for Sustainability Award, open to students and young professionals under the age of 30, and the issue of ESA's third report on Sustainable Development covering 2013–14 data, for the purposes of assessment, transparency and raising awareness. At COP21 in Paris, the ESA Coordination Office on Sustainable Development actively promoted ESA and the potential of space to assist with addressing climate change issues. In particular, ESA was a partner of World Wide Views, a global citizens' consultation on climate and energy organised across almost 80 countries with 10 000 citizens as a contribution to the COP21 discussions, and provided input and speeches on space, sustainable development and relations with society and the planet.

Relationship with EU institutions

In 2015, ESA took several steps to further enhance its relationship with the European Union (EU). Following a restructuring of the European Commission under its new President, Jean-Claude Juncker, ESA focused on consolidating its relationship with the enlarged Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, in particular for the continued implementation of the EU's flagship programmes Galileo and Copernicus and coordination of R&D activities with the EU's Research and Innovation programme, Horizon 2020.

ESA's permanent representation in Brussels ensured that ESA remained visible to the changed European Commission as well as to other EU institutions. This provided visibility for ESA in EU circles, allowing ESA to follow policy developments at EU level.

From mid-2015, the new ESA Director General Jan Woerner reinforced these efforts by supporting the organisation of an EU/ESA informal Space Council, a political platform where Member States of the European Union, ESA Member States, the European Commission and the ESA Director General can meet and exchange views on an equal footing. The discussions showed a general desire by Member States to continue and deepen discussions at this level, as well as for ESA and the European Commission to strengthen and extend their cooperation.

In December 2015, the Commission announced its intention to publish in 2016 a Communication titled 'A Space Strategy for Europe'. This strategy will outline the overall strategic vision for the EU's activities in space during the next decade, while ensuring cooperation and coherence with activities pursued by EU countries individually or through ESA. ESA, in turn, continued to develop its vision for an evolved relationship with the EU in consultation with Member State delegations, discussing the way forward towards a sustainable relationship between the European Space Agency and the European Union and their respective Member States.

Relationship with EU Member States not Members of ESA

On 10 June, the Director General hosted a consultation meeting with representatives of those EU Member States not part of ESA at the Agency's ESAC establishment near Madrid in order to take stock of current ESA cooperation with those countries and present the Agency's latest developments.

Estonia and Hungary signed Accession Agreements in February, thus becoming the 21st and 22nd ESA Member States respectively.

Slovakia and Bulgaria signed European Cooperating State Agreements with ESA in February and in April respectively, Bulgaria becoming the 10th country to have signed an ECS Agreement with ESA.

Latvia and Lithuania signed the Plan for European Cooperating States Charter in January and in September respectively, thereby allowing the implementation of the PECS contracts. Croatia and ESA began discussions on a Cooperation Agreement in May.

United States
In November 2014, ESA astronaut Samantha Cristoforetti flew to the International Space Station on the joint Futura mission with Italy's ASI space agency, and Europe's seventh long-duration flight. During her 199-day stay on board, she carried out an extensive programme of scientific experiments and operated the undocking of ATV *Georges Lemaître*, Europe's last Automated Transfer Vehicle.

On 2 September, ESA astronaut Andreas Mogensen flew to the Space Station from Baikonur to carry out a 10-day mission as part of Expedition 45. His 'iriss' mission tested new technologies and new tele-operation activities.

On 15 December, ESA astronaut Tim Peake flew to the ISS as a member of Expedition 46/47. Scientific experiments and education are two core elements of his six-month Principia mission.

The Rosetta mission was awarded the 2015 John L. 'Jack' Swigert, Jr Award for Space Exploration at the annual Space Symposium in Colorado Springs and featured as the keynote at the Space Technology Hall of Fame dinner.

Russia
ESA participated in the International Aviation and Space Salon MAKS 2015 near Moscow. ESA's presentation showcased European space programmes and exploration projects. The forum also provided the opportunity for the first meeting of the new ESA Director General with the Head of Roscosmos.

ATV *Georges Lemaître* was undocked from the Russian segment of the Space Station on 14 February and the day after was deorbited. Thus ESA/Roscosmos cooperation regarding five ATVs was completed.

Cooperation on board the Space Station proceeded with joint ESA/Russian scientific experiments including Plasma Kristall-4, Immuno-2, SODI DCMIX, MARES and EDOS.

The ExoMars project continued to be the most prominent cooperation activity between ESA and Roscosmos. Work has focused on design and development activities and the completion of the System Preliminary Design Review for the ExoMars 2018 mission. In the frame of a joint Announcement of Opportunity, additional science payload for the surface platform was selected.

For the ExoMars 2016 mission, all test and development activities were completed and the launch campaign started in December in Baikonur.

The Sentinel-3A launch campaign was started in Plesetsk in November.

Estonia and Hungary signed Accession Agreements in February, *thus becoming the 21st and 22nd ESA Member States respectively*

China
ESA, together with the Chinese Academy of Science (CAS), advanced rapidly in the definition of the joint space science mission initiative. ESA and CAS issued a Call for the Joint Mission based on the agreed technical parameters. The Call was open between January and March. In late May, the Senior Science Committee, after careful evaluation of the scientific and programmatic aspects concerning the four mission candidates, including their scientific value, scientific feasibility, timeliness, competitiveness, complementarity with other projects and finally their collaborative environment, recommended that the SMILE mission be selected by ESA and CAS for implementation.

The Dragon programme with the National Remote Sensing Centre of China from the Ministry of Science and Technology continues to yield high-quality scientific data. The current Dragon-3 cooperation was kicked off in 2012 focusing on science and applications development in China using data from ESA and Chinese Earth observation missions.

Space Dialogues
ESA participated in the Tripartite Space Dialogues that the European Commission set up with the United States, China and South Africa.

Japan
ESA and JAXA held regular meetings at director and programmatic level to review their ongoing joint missions (BepiColombo and EarthCARE) and discuss future opportunities.

Argentina
The Executive maintained constant relations with Argentinian authorities to secure local support for the ESA Deep Space Antenna in Malargüe. Argentinian scientists started to benefit from the 10% of the antenna time for domestic scientific experiments.

Israel
The 66th International Astronautical Congress took place in Jerusalem from 12–16 October. As usual, during the Congress, the ESA Director General had several bilateral meetings with his international counterparts.

Italian President Sergio Mattarella *presents the Cavaliere di Gran Croce (Ordine al Merito della Repubblica Italiana) medal to Samantha Cristoforetti in July*

Communications

The Agency's communications objectives for the year included building on the high visibility achieved by ESA's Rosetta campaign in 2014, consistently targeting the general public, decision-makers and media, and exploiting a combination of traditional and social media.

We continued to foster partnerships with recognised brands and influencers, and with entities in daily contact with the public. We translated ESA's main productions into the principal ESA languages and cooperated with national entities to adapt ESA content to their audiences.

Rosetta continued to attract a great deal of attention throughout the year. For example, in April the mission formed the highlight of the European Geophysical Union annual meeting in Vienna. In August, the reaching of perihelion was marked with an online Google Hangout produced from ESOC while, in September, a joint press conference with the DLR presented the latest news during the European Planetary Science Congress in Nantes.

Besides Rosetta, highlights included the 25th anniversary of the NASA/ESA Hubble Space Telescope, the completion of ESA's fifth automated cargo ferry mission, ATV *Georges Lemaître*, and the successful flight of the Intermediate eXperimental Vehicle.

A partnership with Amsterdam Schiphol, *Europe's fourth busiest airport, initiated in 2014 to increase the visibility of ESA activities, progressed to include in 2015 short videos at boarding gates, electronic boards along terminal corridors and video clips on the large screen in the airport's main plaza*

By March, the Galileo satellite navigation system had eight satellites in orbit following the launch of Galileo FM 03 and 04. In November, a press conference was held for ExoMars, before the Trace Gas Orbiter and Schiaparelli were shipped to their launch site.

During the year, several high-level decision-makers and dignitaries were hosted by ESA or visited by ESA representatives. In February, Chancellor Angela Merkel invited German ESA astronaut Alexander Gerst to a briefing in Berlin. In March, HM King Philippe of Belgium visited the ESA centre at Redu.

The mobile version of ESA's web portal, *released during the year*

HM Queen Elizabeth visited the Royal Horticultural Society's 'Rocket Science' exhibition at the Chelsea Flower Show in connection with British ESA astronaut Tim Peake's upcoming mission.

German Parliamentary State Secretary Brigitte Zypries and French President François Hollande visited the ESA Pavilion at the Paris Air & Space Show in June. The inauguration of ECSAT's new building at Harwell in July was attended by the UK Minister for Universities, Science Research and Innovation Jo Johnson and ESA's first Director General Roy Gibson.

Other highlights included the release of the mobile version of ESA's web portal, enhancing accessibility for the ever-increasing audience using smartphones and tablets, and the start of online image delivery under an Open Content license. Open Content is of paramount importance to allow ESA's communication products to reach the largest audience.

In November, the inaugural TEDxESA event took place at ESTEC's Erasmus Centre. TEDx conferences follow the original 'Technology, Entertainment, Design' (TED) model: short, concise talks about inspiring and visionary ideas that have been watched online by large audiences worldwide.

Ban Ki-moon, Secretary-General of the UN, and Volker Liebig, ESA Director of Earth Observation Programmes *at the 'My Planet from Space: Fragility and Beauty' exhibition in New York, in September*

ESA increased its presence on social media with the launch of the ESA Instagram and Spotify channels. While ESA is already very successful on well-established social media channels such as Twitter, Facebook, Flickr and YouTube, Instagram targets a younger audience (aged 12 to 25).

The Spotify channel was created to support music-related social media activities for Tim Peake's Principia mission, as well as other ESA projects. The Principia mission campaign introduced the #spacerocks initiative, which included an online competition and social media support from 75 international bands and musicians.

In 2015, ESA TV covered all ESA launches and events live and its videos have been used both by broadcasters and to feed other ESA channels, such as on YouTube. ESA TV continued its successful co-production of the 'Space' magazine show with Euronews.

During 2015, 10 international press trips and 30 international press conferences and media opportunities were organised. News mentioning ESA had an 'advertising equivalent value' of over €39.2 million (2014: €35.6 million).

Messages from musicians *and bands such as Peter Gabriel and Coldplay supported the social media campaign for Tim Peake's Principia mission*

Education and Knowledge Management

In close partnership with the relevant stakeholders in the Member States, the Education Programme offered, in direct support of national education systems and agendas, improved and new opportunities to national education communities, through:

– A solid primary and secondary school education programme, mainly delivered at national level through a geographically and qualitatively growing European Space Education Resource Office (ESERO) network covering 13 countries: Austria, Belgium, Czech Republic, Denmark, Finland, Ireland, the Netherlands, Norway, Poland, Portugal, Romania, Sweden and UK.
The ESEROs, in close coordination with ESA and national space agencies, continued to use space as a context for teaching and learning science and technology at school; continued to deliver teacher training, classroom resources and new hands-on activities matching national school curriculums and promote awareness of space careers and of the importance of space to society.

– A rich educational programme for university students, complementing and enhancing academic education in the fields of ESA expertise and composed of:
  - Hands-on Space Programmes, proposing a set of recurrent opportunities, ranging from small satellites to scientific and technological experiments, aimed at providing students with practical experience of real space-related projects.
  - A Training and Learning Programme offering a portfolio of training courses enabling the transfer of ESA's theoretical knowhow and expertise in space-related disciplines, ranging from, for example, space sciences to engineering, spacecraft operations, product and quality assurance and project management.

In 2015, in close collaboration with national and European institutional partners, about 450 teacher training sessions were attended by almost 5800 primary and secondary teachers, potentially reaching out to about 174 000 pupils; at least 16 000 university students benefitted from e-learning opportunities, and at least 950 were directly involved in unique educational hands-on space programmes, benefitting from direct transfer of competence by ESA specialists.

Security Office

Of the eight security inspections performed at ESA establishments and stations in 2015, three were performed by an external contractor, selected to provide a fresh, unbiased view of the status of security at these sites (three more such external inspections will be performed in 2016). Security issues at corporate level were addressed with bilateral meetings with the departments responsible, namely Facility Management, Information Technology and Procurement; this approach has been consolidated, and will also be extended to Human Resources in 2016.

Reaccreditations of the classified installations related to the Galileo project were performed successfully at ESTEC (satellite-testing facilities, the PRS laboratory, Project office premises in the T building), at Redu and at ESOC. The project was supported by participating in several security boards and in the accreditation panel.

The Launchers Directorate was supported in the detailed definition of the Security Classification Guide, annex to the Programme Security Instructions already adopted in 2015, specifying the level of classification of all components to be formally protected.

The security measures implemented across the Agency enable ESA to undertake security-related programmes. A new project, 'Cyber Range', was started to develop a space mission security in which future mission scenarios for different categories can be simulated and tested with the aim of ensuring that security risks, in particular cyber-related, are properly addressed before it is too late.

Notes to the Financial Statements

The Financial Statements presented in this document are the sixth set drawn up under the new basis of accounting and financial system introduced by the Financial Management Reform (Finref) as of 1 January 2010.

The Finref project launched an entirely new operating model in 2010 based on the SAP Enterprise Resource Planning (ERP) tool suite, extensively covering the operational management of all the Agency's projects and activities as well as its financial processes. Those processes were defined by newly adopted Financial Regulations, which included the requirement to produce annual Financial Statements in accordance with International Accounting Standards for the Public Sector (IPSAS).

Significant progress has been made since 2010 towards improving the presentation of the Financial Statements. The Audit Commission has acknowledged the efforts made so far and was of the opinion that the Financial Statements for the last three years were compliant with IPSAS requirements in all material respects.

2015 was marked by the end of the transition period provided for under IPSAS 17 for property, plant and equipment.

Huge efforts have been made to verify the completeness and correct valuation of the ESA controlled fixed assets identified and recorded since 2010. A full physical inspection of tangible fixed assets was performed in 2015. This exercise led to a major restructuring of fixed assets master data, a review of the useful life of ESA spacecraft, main technical facilities, ground stations and administrative buildings. Corrections were implemented retroactively and a restatement of 2014 accounts was necessary. Following the inspections, disposals of assets were recorded. The ESA procedure on fixed assets management was finalised and gradually implemented. Intensive awareness and training sessions have been deployed ESA wide.

Emphasis was also placed on the implementation of audit recommendations outstanding. On this basis, further improvements were made to increase the quality of the accounting data and the presentation of the Financial Statements in compliance with IPSAS.

The main components of the ESA Financial Statements presented herewith are:

- Statement of financial position;
- Statement of financial performance;
- Statement of changes in net assets/equity;
- Cash flow statement.

Some items, such as fixed assets, subject to first IPSAS recognition, are presented in these statements with only the counterpart in the reserves, but without impact on the statement of financial performance.

At the end of 2015, final fixed assets amount to €3585.2 million and assets under construction to €3673 million net value.

The Net Deficit of 2015 amounts to €95 million, after capitalisation of Assets Under Construction and work-in-progress, as compared to a deficit of €1828.6 million in 2014 (restated).

The significant reduction of the 2015 deficit compared to 2014 is due to the absence in 2015 of exceptional events that occurred in 2014 (GMES assets under construction written off following transfer of Sentinels to the European Commission and write-down of ATV work-in-progress).

The 2015 net deficit breaks down into:

- €334 million net surplus for ESA (€1677.9 million net deficit in 2014)
- €431.1 million net deficit for Pensions (€153.3 million in 2014)
- €2.1 million net surplus for Social Security (€2.6 million in 2014)

STATEMENT OF FINANCIAL POSITION

	2015 Million €	2014 restated Million €
TOTAL ASSETS	**10 982.8**	**10 245.3**
Current assets	**2201.6**	**1820.0**
Cash and cash equivalents	**963.5**	**739.0**
Unrestricted cash and cash equivalents	298.2	101.0
Restricted cash and cash equivalents	665.3	638.0
Receivable from non-exchange transactions	**348.1**	**468.7**
Outstanding contributions Member/Participating States	285.4	358.3
Outstanding contributions EC	0.6	0.9
Member States reimbursable taxes	62.1	109.5
Receivable from exchange transactions	**672.2**	**405.5**
Other customers	12.1	20.1
Prepayments and other amounts receivable	660.1	385.4
Inventories	**217.8**	**206.8**
Non-current assets	**8781.2**	**8425.3**
Long-term receivables from non-exchange transactions	2.7	2.8
Long-term receivables from exchange transactions	981.0	780.8
Financial assets	539.3	487.4
Land and buildings	1125.0	1234.2
Technical plant and equipment	482.1	522.5
Spacecraft and space laboratories	1547.8	1878.4
Administrative equipment and vehicles	289.7	303.8
Intangible fixed assets	140.6	143.1
Assets under construction	3673.0	3072.3
TOTAL LIABILITIES	**6623.9**	**5776.7**
Current liabilities	**2820.0**	**2529.1**
Payables under exchange transactions	**1313.6**	**939.2**
Current payables	738.4	708.9
Pre-financing from exchange transactions	547.2	216.3
Deferred income	28.0	14.0
Contributions and other payables	**1506.4**	**1589.9**
Prepaid contributions and other amounts payable to Member/Participating States	125.2	197.6
Pre-financing from non-exchange transactions	607.8	667.3
Other payables	168.2	265.3
Other current financial liabilities	140.0	0.0
Employee benefits	198.2	193.7
Provisions	267.0	266.0
Non-current liabilities	**3803.9**	**3247.6**
Employee benefits	3428.7	2944.3
Pre-financing from non-exchange transactions	326.8	270.1
Pre-financing from exchange transactions	48.4	33.2
NET ASSETS	**4358.9**	**4468.6**
Reserves	**7011.1**	**8701.2**
Amounts to be called from Member States	**–2557.2**	**–2404.0**
Employee benefits and other amounts	–2557.2	–2404.0
Net Surplus/(Deficit) for the period	–95.0	–1828.6
TOTAL NET ASSETS	**4358.9**	**4468.6**

STATEMENT OF FINANCIAL PERFORMANCE

	2015 Million €	2014 restated Million €
Operating revenues	**4091.6**	3670.0
Contributions from Member/Participating States	3354.7	3089.1
Other contributions and grants	279.9	228.8
Revenues from exchange transactions	223.4	108.7
Social security	16.7	16.5
Pension schemes	22.2	19.7
Other operating income	194.7	207.2
Operating expenses	**4205.7**	5515.3
Purchases	2595.3	2646.3
External services	943.4	996.0
Staff expenses	297.7	280.9
Social security	29.5	29.0
Pension schemes	568.5	287.1
Other operating expenses	201.1	189.3
Expenses from non-exchange transactions	107.3	101.2
Expenses transferred to assets	−1036.7	−1495.2
Delegated procurement expenses transferred to amounts receivable	−427.8	−321.0
Expenses transferred (to)/from work in progress	221.6	−305.8
Expenses transferred to fixed assets under construction	−830.5	−868.4
Depreciation	712.3	634.2
Write-downs inventories and fixed assets	−218.9	1824.9
Provisions	6.2	21.6
NET SURPLUS/(DEFICIT) FROM OPERATING ACTIVITIES	**−114.1**	−1845.3
Financial activities	**19.1**	16.7
Financial revenue	22.4	28.7
Financial expenses	3.3	12.0
NET SURPLUS/(DEFICIT) FROM ORDINARY ACTIVITIES	**−95.0**	−1828.6
Extraordinary items	**0.0**	0.0
NET SURPLUS/(DEFICIT) FOR THE PERIOD	**−95.0**	−1828.6

STATEMENT OF CHANGES IN NET ASSETS/EQUITY

Million €

		1 January, 2014	Errors – 2014 opening balance impact	1 January, 2014 restated	Movements 2014
RESERVES	A	**7783.3**	**486.7**	**8270.1**	**431.1**
Member States capital and reserves		**4571.9**	**550.9**	**5122.8**	**–619.3**
Revaluation differences		4540.0	550.9	5090.9	–636.2
Currency Exchange Gains Reserve		5.3		5.3	
Sundry reserves		5.1		5.1	
Other reserves		21.5		21.5	16.9
Social security reserve		20.5		20.5	2.1
Buffer Fund fair value reserve		5.3		5.3	10.5
Open Sky Technologies Fund fair value reserve		–4.3		–4.3	4.3
Accumulated Surplus		**3211.4**	**–64.2**	**3147.2**	**1050.4**
AMOUNTS TO BE CALLED FROM MEMBER STATES	B	**–2195.5**	**12.8**	**–2182.7**	**–221.3**
Member States pension scheme receivable		–2195.4	12.8	–2182.6	–221.3
Accumulated Deficit		–0.1		–0.1	
Net Surplus / (Deficit) for the Period	C	202.0		202.0	–1783.9
TOTAL NET ASSETS	A+B+C	**5789.8**	**499.5**	**6289.4**	**–1574.1**

		Errors – 2014 impact	Year 2014 restated	Allocation of 2014 surplus/deficit	Movements 2015	Year 2015
RESERVES	A	**0.0**	**8701.1**	**–1675.3**	**–14.6**	**7011.1**
Member States capital and reserves			**4503.5**	**–974.4**	**–10.6**	**3518.5**
Revaluation differences			4454.7	–970.2	–0.0	3484.5
Currency Exchange Gains Reserve			5.3	–1.7		3.6
Sundry reserves			5.1	–5.0		0.1
Other reserves			38.4	2.5	–10.6	30.3
Social security reserve			22.6	2.5		25.1
Buffer Fund fair value reserve			15.8		–10.6	5.2
Open Sky Technologies Fund fair value reserve						0.0
Accumulated Surplus			**4197.6**	**–700.9**	**–4.0**	**3492.7**
AMOUNTS TO BE CALLED FROM MEMBER STATES	B	**0.0**	**–2404.0**	**–153.2**	**0.0**	**–2557.2**
Member States pension scheme receivable			–2403.9	–153.2		–2557.1
Accumulated Deficit			-0.1			–0.1
Net Surplus / (Deficit) for the Period	C	–246.7	–1828.6	1828.6	–95.0	–95.0
TOTAL NET ASSETS	A+B+C	**–246.7**	**4468.5**	**0,1**	**–109.6**	**4358.9**

STATEMENT OF CASH FLOW

	2015 Million €	2014 restated Million €
Net cash flows	**235.1**	**–115.3**
Net cash flows from operating activities	**981.9**	**867.8**
Surplus/(deficit) from ordinary activities	–95.0	–1828.6
Non-cash movements	499.6	2484.7
Depreciation and impairment	712.3	639.2
Provisions	6.2	21.6
Write-downs inventories and fixed assets	–218.9	1824.9
Revenues/expenses transferred to/from reserves		–1.0
Decrease (Increase) in Deferrals/accruals of past or future operating cash receipts or payments	577.3	211.6
Decrease/(increase) in inventories	221.6	–305.1
Decrease/(increase) in receivables from Member States	124.0	–2.1
Decrease/(increase) in other receivables	–192.0	–507.4
Decrease/(increase) in other current assets	–274.7	171.3
Increase/(decrease) in payable to Member/Participating States	–80.1	59.8
Increase/(decrease) in pre-financing	343.3	601.2
Increase/(decrease) in other payables	–53.5	–12.4
Increase/(decrease) in provisions for employee benefits	488.7	206.4
Net cash flows from investing activities	**–886.9**	**–983.0**
Acquisition of fixed assets	–835.0	–921.3
(Increase)/decrease in financial investments (portfolio)	–51.9	–61.7
Net cash flows from financing activities	**140.0**	**0.0**
Increase/(decrease) in financial debt	140.0	
Net increase/(decrease) in cash and cash equivalents	**235.1**	**–115.3**
Cash and cash equivalents at the beginning of the year	739.0	843.8
Effect of changes in fair value of cash and cash equivalents	10.6	–10.5
Cash and cash equivalents at year-end	963.5	739.0

Independent auditor's report

To the Council of the European Space Agency

Report on the Financial Statements

We have audited the financial statements of the European Space Agency for 2015, issued under document reference ESA/AF(2016)1, submitted to the Commission on 13 May 2016, which comprise the statement of financial position as at 31 December 2015, the statement of financial performance, the statement of changes in net assets and the statement of cash flow for the year then ended, and a summary of significant accounting policies and other explanatory information.

Director General's Responsibility for the Financial Statements

The Director General of the European Space Agency is responsible for the preparation and fair presentation of these financial statements in accordance with International Public Sector Accounting Standards (IPSAS) and in accordance with the requirements of the Financial Regulations, and for such internal control as he determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on the financial statements, including the aspect of regularity, based on our audit which has been performed in accordance with article 51 and 52 and Annex II of the Financial Regulations and with International Standards on Auditing (ISA). Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance on whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence on the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of the European Space Agency as at 31 December 2015, and its financial performance and its cash flows for the year then ended in accordance with IPSAS.

Corrections to previous years' financial statements

The end of the transitional period provided by IPSAS 17 Property, Plant and Equipment has required the Agency to fully recognise fixed assets for the year ended 31 December 2015. This recognition led to significant corrections to the previous years' fixed asset balances as disclosed in part VI of the 2015 financial statements. The Commission's opinion is not modified in respect of this matter.

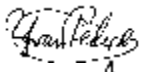
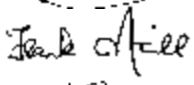
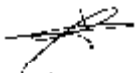
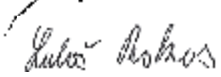
Report on other legal and regulatory requirements

In our opinion, the transactions of the European Space Agency that have come to our attention as part of our audit of the financial statements, have, in all significant respects, been in accordance with the Financial Regulations and legislative authority of the Agency.

Further details of our audit of the financial statements, including the aspect of regularity, are set out in our Audit Report on the European Space Agency's financial statements 2015, which we have issued in accordance with article 52 and Annex II of the Financial Regulations.

Signed on 21 June 2016

The Audit Commission:

Yvan Pedersen		Chair
Frank O'Neill		Chair Emeritus
Jean-Luc Vivet		Member
Luboš Rokos		Member

annex

Events & International Exhibitions

Events and exhibitions either organised by, or with support from, ESA Communications.

EU Space Policy *Brussels, Belgium* *27–28 January*	7th Annual Conference
Business Bridge Europe Conference *Brussels, Belgium* *28–29 January*	
Experiences, Challenges and Future Perspectives *Warsaw, Poland* *18–21 March*	Space High Level Meeting of Innovation and Industry Department, Ministry of Economy of Poland
ECSITE Space Group Conference *Trento, Italy* *9–13 June*	European Network of Science Centres and Museums workshops/conference
Paris International Air Show *Le Bourget, Paris* *15–21 June*	ESA Pavilion with events and high-level visits
My Planet from Space *UN building, Vienna, Austria* *9 July–8 September*	UNOOSA exhibition
UK Space Conference: 'Space-enabled Futures' *Liverpool, UK* *13–15 July*	ESA stand promoting space technologies
MAKS Moscow Air Show *Moscow, Russia* *25–30 August*	ESA stand at well-known international air and space trade fair
Raumschiff Erde (Spaceship Earth) *Ars Electronica Centre, Linz, Austria* *31 August*	One-year exhibition opened
Forum 2015 *Vienna, Austria* *16 September*	Media conference with Minister of Transport, Innovation and Technology

European Space Expo EGNOS and Copernicus *Milan, Italy* *18 September–4 October*	European Commission exhibition with ESA contributions on Galileo
German Aerospace Day *EAC/DLR, Cologne, Germany* *20 September*	Annual open day of ESA facilities
XXVIII Congress *Stockholm, Sweden* *20–27 September*	Association of Space Explorers annual meeting in association with Swedish National Space Board
European Researchers' Night *Frascati, Italy* *Athens, Greece* *25 September*	Organised with Frascati Scienza, the Hellenic World Foundation, and the University and the Observatory of Athens
ESTEC Open Day *Noordwijk, Netherlands* *4 October*	Large-scale annual open day organised during World Space Week
L'Espace pour le Climat/ Space for Climate *Paris, France* *17–30 October*	Exhibition for UN Climate Conference, COP 21
My Planet from Space *Palais de la Découverte, Paris, France* *December 2015–June 2016*	Exhibition with CNES for UN Climate Conference, COP 21
TEDxESA at ESTEC *Noordwijk, Netherlands* *11 November*	Inaugural TEDx event with ESA's Technology Transfer Office
ARTES Open Days *Noordwijk, Netherlands* *12–13 November*	Presentations on ESA's telecom projects and display of related hardware
Comunicando. De las señales de humo a los satélites *Ciudad de las Artes y las Ciencias, Valencia, Spain*	Exhibition on history of telecommunications

Agreements signed in 2015

The Agreement between the European Space Agency and the Deutsches Zentrum für Luft und Raumfahrt e.V. (DLR) concerning the installation and utilisation of certain assets located at Lampoldshausen, was extended in accordance with its Article 15 for a further period of one year (1 January 2015 until 31 December 2015) by an Exchange of Letters between the Parties dated 23 December 2014 and 12 January 2015.
(LEG 234, add 11)

Amendment No. 1 to the Delegation Agreement between the European Union and the European Space Agency on the Deployment of the European Satellite Navigation Programme Galileo, was signed in Brussels on 18 December 2014 by Daniel Calleja, Director General of DG Enterprise and Industry for the European Commission, and in Paris on 16 January 2015, by Jean-Jacques Dordain, Director General of ESA. It entered into force upon signature by the Parties, i.e. 16 January 2015. It shall remain in force until 31 December 2021, unless terminated earlier in accordance with Article 47.
(LEG/431, add1)

The PECS Charter between the European Space Agency and the Government of the Republic of Latvia was signed in Paris on 30 January 2015 in Paris by the Latvian Ambassador, her Excellency Sanita Pavluta-Deslandes and the ESA Director General, Jean-Jacques Dordain. Pursuant to Article 14 of the ECS Agreement, the ESA/Latvia ECS Agreement thereby enters into force on 30 January 2015 and will remain in force for a period of 5 years i.e. until 29 January 2020.
(LEG/441)

The European Cooperating State Agreement (ECS) between the European Space Agency (ESA) and the Slovak Republic was signed on 16 February 2015 in Bratislava by Karlheinz Kreuzberg, ESA's Head of the Director General's Cabinet and by Juraj Draxler, Minister of Education, Science, Research and Sport of the Slovak Republic.
(LEG/443)

The European Cooperating State Agreement (ECS) between the European Space Agency and the Government of the Republic of Bulgaria was signed in Sofia on 8 April 2015 by Eric Morel de Westgaver, Director of Industry, Procurement and Legal Services and Bojidar Loukarsky, Minister of Economy of the Republic of Bulgaria.
(LEG/446)

The Amendment to the Implementing Arrangement between the European Space Agency and the European Defence Agency (EDA) on their cooperation on a Demonstration Project on Satellite-based Secure Command and Control Data Links for Remotely Piloted Aircraft Systems (RPAS) Applications, was signed in Noordwijk on 26 March 2015 by Magali Vaissiere, ESA Director of Telecommunications and Integrated Applications, and in Brussels on 30 March 2015, by Rini Goos, EDA Deputy Chief Executive.
(LEG/445)

The renewal of the Agreement between the European Space Agency and the European Centre for Medium-range Weather Forecasts (ECMWF) for cooperation on exchange of information and expertise was agreed by an exchange of letters signed by Dr Volker Liebig, ESA Director of Earth Observation Programmes, on 19 May 2015 and by Professor Alan J Thorpe, Director General of ECMWF, on 5 June 2015.
(LEG/295, add2)

The Addendum to the Agreement between the Spanish Ministry of Defence and the European Space Agency for the Installation, Testing and Validation of a Monostatic Breadboard Radar at the Santorcaz Naval Radio Communication Station, was signed in Noordwijk on 22 June 2015 by Thomas Reiter, ESA Director of Human Spaceflight and Operations, and in Madrid on 23 June 2015 by Juan Antonio Carrasco Juan, General, Chief of the Joint Staff (JEMACON) for the Spanish Ministry of Defence.
(LEG/397, add1)

The Working Arrangement between the European GNSS Agency and the European Space Agency, was signed in Paris on 2 July 2015 by Johann-Dietrich Wörner, ESA Director General, and in Prague on 7 July 2015, by Carlo des Dorides, Executive Director of the European GNSS Agency. This Arrangement entered into force on the date of its signature by the last Participant, i.e. on 7 July 2015.
(LEG/447)

The Memorandum of Understanding between the European Environment Agency and the European Space Agency concerning the Establishment of their Cooperation was signed in Frascati on 15 July 2015 by Dr Hans Bruyninckx, Executive Director for the European Environment Agency, and by Dr Volker Liebig, Director of Earth Observation Programmes for the European Space Agency.
(LEG/454)

The Cooperation Agreement between ESA and the European Organisation for Astronomical Research in the Southern Hemisphere (ESO) concerning the terms and conditions governing the cooperation between the two institutions was signed on 20 August 2015 by Johann-Dietrich Wörner, ESA Director General and by Tim de Zeeuw, Director General of the European Organisation for Astronomical Research in the Southern Hemisphere. This Agreement entered into force on the date of its signature, i.e. 20 August 2015, and shall remain in force until 19 August 2020.
(LEG/448)

The Agreement between ESA and the Republic of Estonia regarding the accession of Estonia to the ESA Convention and related terms and conditions was signed in Paris on 4 February 2015 by Jean-Jacques Dordain, ESA Director General, and by Anna Sulling, Minister - Ministry of Economic Affairs and Communications. According to the notification of the French Ministry of Foreign Affairs on 10 September 2015, the Republic of Estonia deposited with the French Government its instrument of accession regarding the Convention for the establishment of a European Space Agency. The Republic of Estonia has thus become the twenty-first Member State of the Agency as from 1 September 2015.
(LEG/442)

The PECS Charter between the European Space Agency and the Government of the Republic of Lithuania was signed on 28 September 2015 by the Lithuanian Minister of Economy, Evaldas Gustas and the ESA Director General, Johann-Dietrich Wörner.
(LEG/449)

The Agreement between EUMETSAT and the European Space Agency concerning the cooperation on the MetOp Second Generation series of Satellites was signed in Paris on 5 October 2015 by Alain Ratier, Director General of Eumetsat and by Dr Volker Liebig, ESA Director of Earth Observation Programmes (LEG/450)

The Second Amendment to the Implementing Arrangement between ESA and Eumetsat concerning cooperation on GMES Sentinel-3 was signed in Darmstadt on 9 September 2015 by Mr Alain Ratier, Director General of Eumetsat and in Paris on 5 October 2015 by Dr Volker Liebig, ESA Director of Earth Observation Programmes.
(422, add1)

The Agreement between ESA and Hungary regarding the accession of Hungary to the ESA Convention and related terms and conditions was signed in Budapest on 24 February 2015 by Mr Jean-Jacques Dordain, ESA Director General, and by Ákos Kara, Minister of State for Infocommunication and Consumer Protection, Ministry of National Development. According to the notification of the French Ministry of Foreign Affairs of 9 November 2015, Hungary deposited with the French Government its instrument of accession regarding the Convention for the establishment of a European Space Agency on 4 November 2015. Hungary has thus become the twenty-second Member State of the Agency as from 4 November 2015.
(LEG/444)

The Exchange of Letters between the European Space Agency (ESA) and the National Aeronautics and Space Administration (NASA) concerning the extension of the Agreement on the JUICE Mission, was signed in Paris on 9 November 2015 by Frédéric Nordlund, Head of the International Relations Department for the ESA letter, and in Washington on 16 November 2015 by Karen C. Feldstein, Director Science Division for the NASA reply.
(424, add1)

The Delegation Agreement between the European Union, represented by the European Commission and the European Space Agency on the Implementation of Horizon 2020 – Framework Programme for Research and Innovation in Satellite Navigation, was signed in Brussels on 2 December 2015, by Lowri Evans, Director General – DG Internal Market, Industry, Entrepreneurship and SMEs for the European Commission, and by Johann-Dietrich Wörner, Director General for the European Space Agency. This Delegation Agreement shall enter into force on 2 December 2015, and shall remain in force until 31 December 2023.
(LEG/453)

The Implementing Arrangement between Eumetsat and ESA concerning Cooperation on Sentinel-5, was signed in Darmstadt on 14 December 2015 by Alain Ratier, Eumetsat Director General, and in Paris on 17 December 2015 by Volker Liebig, ESA Director of Earth Observation Programmes.
(LEG/452)

The Implementing Arrangement between Eumetsat and ESA concerning Cooperation on Sentinel-6/JASON-CS, was signed in Darmstadt, on 14 December 2015 by Alain Ratier, Eumetsat Director General, and in Paris on 17 December 2015 by Volker Liebig, ESA Director of Earth Observation Programmes.
(LEG/451)

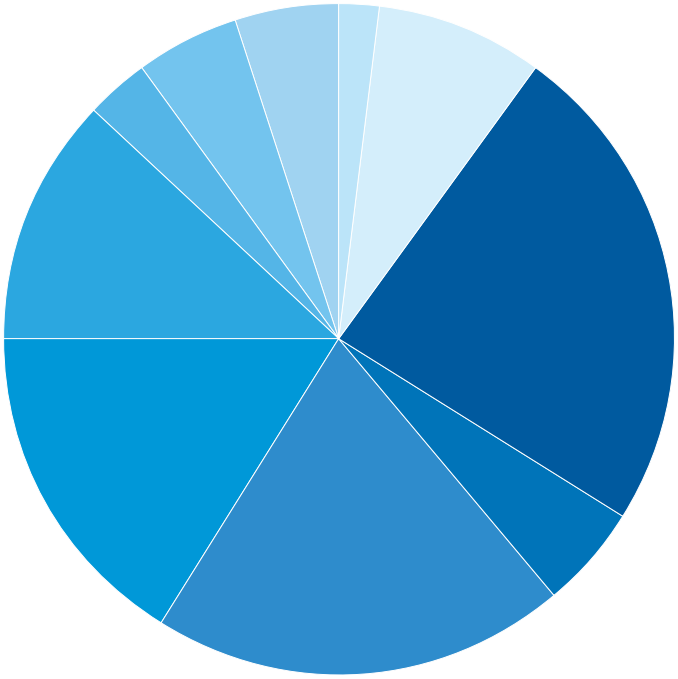
Patents

At the end of 2015, the portfolio contained 132 inventions protected by 411 patents (granted or patent applications still under examination by the Patent Office).

The inventions cover a wide variety of disciplines represented in ESA. Telecommunication is the most widely represented, with 36% of the inventions in RF payload and systems and 18% in electromagnetic technologies and techniques.

TEC is by far the largest contributor, having produced 71% of the inventions (of which 48% of the portfolio stems from TEC-E's activities). This is easily explained by the fact that inventions are usually generated in the preparation or during the course of TRP (Technology Research Programme) or GSTP activities, when the technology readiness level (TRL) is still relatively low. When analysing the relevance of the portfolio for ESA's activities, one can see that 70% of the inventions can be used for Space Applications and 23% for Space Science & Exploration.

In 2015, out of 21 invention disclosures received, 13 were in collaboration with European industry. Six patent applications were filed by ESA. ESA waived its rights in respect of 4 inventions that were done in collaboration with industry partners that had planned to commercialise them. In addition, ESA decided to enter into 1 co-ownership agreement.



New inventions filed:

YEAR	ESA/PAT	Application Number	TITLE	Name of ESA inventors	Section	Filing
2015	649	GB1513395.2	Advance Distribution Network with integrated bend-pass filter functions	Petronilo Martin-Iglesias	TEC-ETE	GB
2015	658	GB1507880.1	Interferometric Radio Occultation	Manuel Martin Neira	TEC-ETP	GB
2015	657	PCT/EP2015/067815	Wave Guide branching switch	Christophe Ernst	TIA-TTP	PCT
2015	662	GR3749/5-7-2016	Rechargeable electrochemical lithium cell	Maria Nestoridi	TEC-EPB	GR
2015	668	EP 15171363.3	Method for the unambiguous tracking of BOC (Binary Offset Carrier) signals	Jose Antonio Garcia Molina	TEC-ETN	EP
2015	675	PCT/EP2016/063358	Interference-resilient flexible techniques for payload resource allocation in broadband satellites	Alberto Ginesi, Pantelis-Daniel Arapoglou and Emiliano Re	TEC-ETC	PCT

Extension of protection decided in 2015:

YEAR	ESA/PAT	TITLE	Name of ESA inventors	Section	Filing
2015	537	Structure for shielding an antenna from radio interference	Francisco Amarillo Fernandez Joren Samson Antonio Castro Garcia	TEC-ETN NAV-PRS HSO-OGE	EP
2015	584	Data detection method and data detector for signals transmitted over a communication channel with inter-symbol interference	Nader Alagha	TEC-ETC	US and EP
2015	597	Beam-forming network for an array antenna and array antenna comprising the same	Piero Angeletti Giovanni Toso Daniele Petrolati	TEC-ETE TEC-EEA TEC-ETP	US and EP
2015	600	Method of manufacturing a metal matrix composite component by use of a reinforcement preform	David Jarvis	TEC-TS	US and EP
2015	601	Method of manufacturing a metallic component from individual units arranged in a space filling arrangement	David Jarvis Wayne Voice	TEC-TS TEC-TS	US and EP
2015	613	Hand control device	Andre Schiele	TEC-MMA	US and CH
2015	615	Additive manufacturing method using focused light heating source	David Jarvis Wayne Voice	TEC-TS TEC-TS	US
2015	617	Transmit power control in a spread-spectrum unslotted random access communication system	Riccardo de Gaudenzi	TEC-ET	US, EP and IL
2015	618	Radio-frequency power amplifier with broadband envelope tracking	Christophe Delepaut Nicolas Le Gallou	TEC-EPM TIA-PRL	US, EP and JP

YEAR	ESA/PAT	TITLE	Name of ESA inventors	Section	Filing
2015	619	Array antenna with optimised elements positions and dimensions	Giovanni Toso Piero Angeletti	TEC-EEA TEC-ETE	US and EP
2015	621	Deployable antenna frame	Julian Santiago Prowald Kees Van't Klooster	TEC-ET TEC-EEA	EP and US
2015	623	Method and apparatus for transmitting data packets over a transmission channel shared by a plurality of users	Riccardo de Gaudenzi Oscar del Rio	TEC-ETE TIA-PL	US and EP
2015	636	Dual-band multiple beam reflector antenna for broadband satellites	Nelson Fonseca	TEC-EEA	US
2015	638	Manufacturing of a ceramic article from a metal preform or metal matrix composite preform provided by 3d-printing or 3d-weaving	David Jarvis Wayne Voice	TEC-TS TEC-TS	US and EP
2015	641	Joint transmitter signal processing in multi-beam satellite systems	Pantelis-Daniel Arapoglou Alberto Ginesi	TEC-ETC TEC-ETC	PCT
2015	645	Differential wired communication link quality detector and differential wired communication link quality detection method	Richard Jansen Jorgen Ilstad	TEC-EDM TEC-EDD	US

Chairs of Council, Programme Boards and other delegate bodies 2015

Chair of the Council	Harald Posch (AT)	(until May 2015)
	Bo Andersen (NO)	(as of June 2015)
	Jean-Yves Le Gall (FR)	(as of June 2015)
Vice-Chair	Bo Andersen (NO)	(until June 2015)
	Jean-Yves Le Gall (FR)	(until June 2015)
Vice-Chair	Klaus Pseiner (AT)	(as of June 2015)

Science Programme Committee	Roel Gathier (NL)
Administrative and Finance Committee	Helene Körling (SE)
Industrial Policy Committee	Cristina Falvella (IT)
International Relations Committee	Michal Fridrich (CZ)
Security Committee	Kai Knape (FI)
Human Spaceflight, Microgravity and Exploration Programme Board	Pilar Roman Fernandez (ES)
Launchers Programme Board	Daniel Neuenschwander (CH)
Earth Observation Programme Board	Jacques Nijskens (BE)
Programme Board on Satellite Navigation	Catherine Mealing-Jones (GB)
Joint Board on Communication Satellite Programmes	Catherine Mealing-Jones (GB)
Space Situational Awareness Programme Board	Klaus Steinberg (DE)

National delegations to Council in 2015

AUSTRIA
Andreas Geisler
Klaus Pseiner
Andrea Kleinssasser

BELGIUM
Eric Beka (until September 2015)
Jacques Nijskens
Frank Monteny

CZECH REPUBLIC
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Václav Kobera

DENMARK
Peter Sloth
Gorm Kofoed Petersen

ESTONIA (as of October 2015)
Madis Võõras
Marika Popp

FINLAND
Kari Tilli (until 19 March 2015)
Ilona Lundström (as of 20 March 2015)
Kimmo Kanto
Marjaana Aarnikka

FRANCE
Jean-Yves Le Gall (Head of Delegation until May 2015)
Joël Barre
Thierry Duquesne

GERMANY
Jan Woerner (until 30 June 2015)
Pascale Ehrenfreund (as of 1 August 2015)
Gerd-Achim Gruppe
Rolf Densing
Karl-Friedrich Nagel

GREECE
Christos Vasilakos (until March 2015)
Thomas Maloutas (as of April 2015)
Nikolaos Prekas

HUNGARY (as of November 2015)
Fruzsina Tari
Szilvia Szántó

IRELAND
Michael Davitt
Tony McDonald

ITALY
Roberto Batiston
Augusto Cramarossa
Laura Aghilarre

LUXEMBOURG
Marc Serres
Mathias Link

NETHERLANDS
Jasper Wesseling
Frits von Meijenfeldt
Nico van Putten

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Bo Andersen (Head of Delegation until May 2015)
Geir Hovmork
Knut Myrvang

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Anna Nałęcz-Kobierzycka

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José Carlos Caldeira (as of June 2015)
Pedro Carneiro
Luis Serina

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Oana Maria Neagu

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Begoña Cristeto
Francisco Marín (as of June 2015)
Juan Carlos Cortés Pulido
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SWITZERLAND
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UNITED KINGDOM
David Parker
Alice Bunn
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Luc Brûlé (until March 2015)
Sylvain Laporte (as of March 2015)
Jean-Claude Piedboeuf
Jean-Pierre Arseneault

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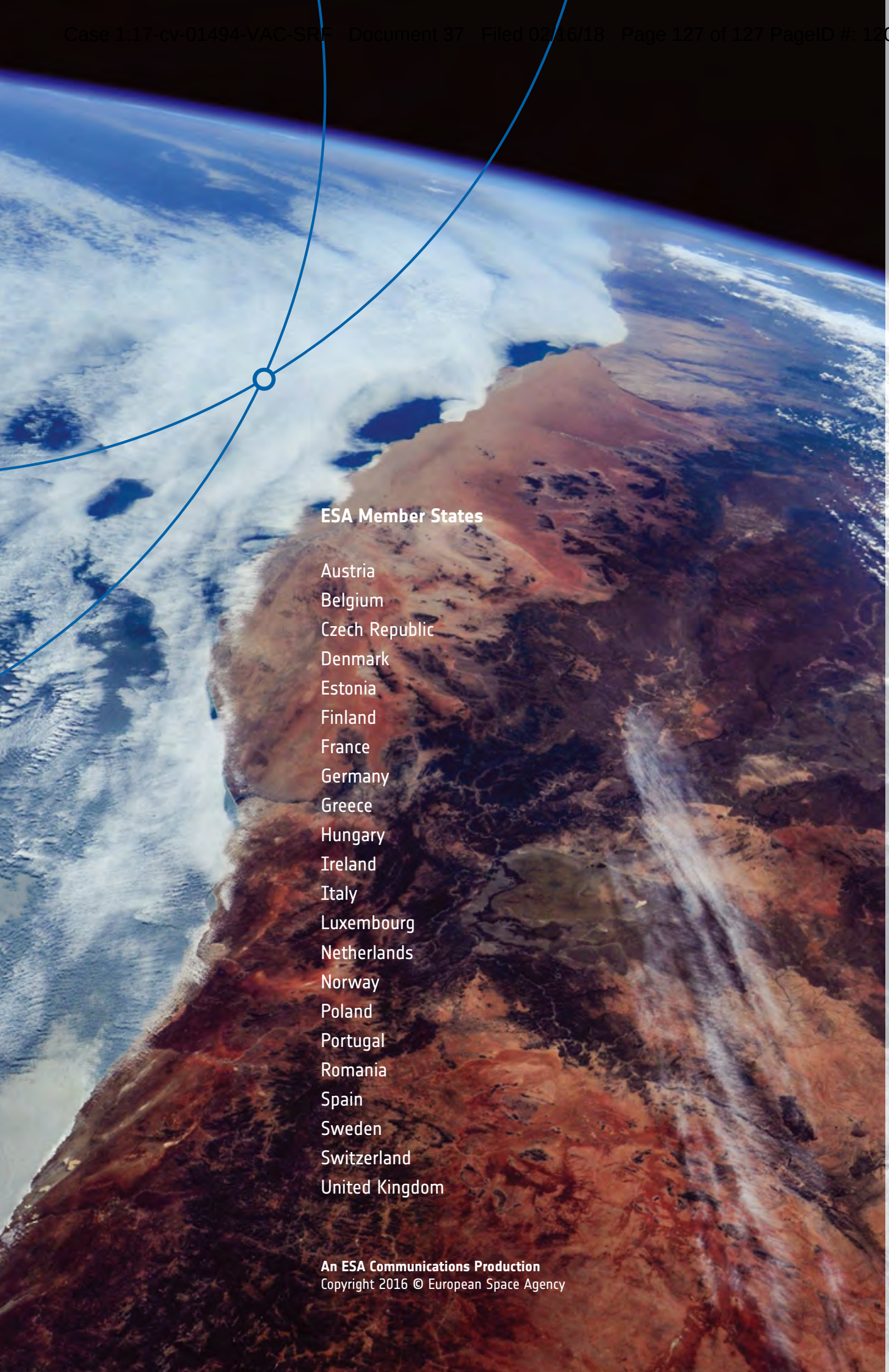

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