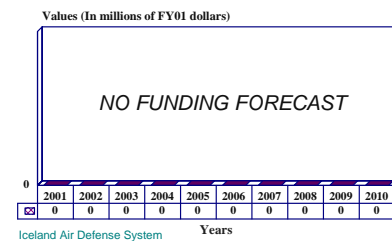


Iceland Air Defense System (IADS) - Archived 12/2001

Outlook

- Forecast International expects the Iceland Air Defense System to be provided with Link 16 communications capability.
- Look for US Air Force to provide management and technical support for IADS Link 16 communications capability.

Forecast Funding Levels
2001 - 2010



Orientation

Description. The Iceland Air Defense System (IADS) is an air defense system that gives Iceland the ability to communicate with NATO Airborne Early-Warning Surveillance and Control (AWACS) aircraft.

Sponsor

US Air Force
North Warning and North Atlantic Defense
System Directorate
Electronic Systems Center
Hanscom AFB, Maryland (MA)
USA

Contractors

Raytheon Company
141 Spring Street
Lexington, Massachusetts (MA) 02421
USA
Tel: +1 781 862 6600
Fax: +1 781 860 2172
Web site: <http://www.raytheon.com>
(Upgrade prime contractor, previously interim system
prime contractor)

Digital Equipment Corp (DEC)
146 Main Street
Maynard, Massachusetts (MA) 01754-2571
USA
Tel: +1 508 493 5111
Fax: +1 508 493 8780
(Subcontractor for upgrade computers)

Lockheed Martin

6801 Rockledge Drive
Bethesda, Maryland 20817
USA
Tel: +1301 897 6000
Web site: <http://www.lockheedmartin.com>
(FPS-117(V)5 radar)

ITT Industries

Gilfillan
7821 Orion Avenue
Van Nuys, California (CA) 91409-7713
USA
Tel: +1 818 988 2600
Fax: +1 818 901 2435
Web site: <http://www.ittgil.com>
(GE subcontractor)

Status. IADS was accepted for service after final testing in 1998. In July 1999, NATO authorized a US\$28 million upgrade, to install Link 16 capability to IADS.

Total Produced. Four FPS-117(V)5s delivered.

Application. To provide control of Icelandic airspace and to provide air defense for Iceland. This is a NATO effort.

Price Range. The FPS-117 has a price range of US\$5 to US\$10 million.

Technical Data

Design Features. IADS consists of four minimally attended long range FPS-117 radar that are located at Bolungarvik, Gunnolfsvikurfjall, Keflavik and Stokksnes. The radar are integrated with a Control and Reporting Center (CRC). The CRC, in turn, has communications and data processing equipment that mechanizes the Iceland Command and Control

Environment (ICCE) to improve communication and functional interfaces with AWACS surveillance aircraft.

Each radar site consists of a radome-topped single-story building. A transportable shelter inside each building stores electronic and data processing systems, allowing equipment from one radar to be transported to another during a crisis.

Variants/Upgrades

The major focus of IADS work from 1990 to 1996 was the C³ upgrade effort being handled by Hughes (now Raytheon Company). This upgrade improved the Icelandic air defense capability and coverage of the entire North Atlantic region by integrating existing air defense systems. Hughes was essentially supplying a new system that replaced existing equipment the company had installed as an interim effort in 1988. Not only was equipment being replaced, but the Ada standard DoD computer language was implemented throughout, marking IADS the world's first major air defense system to do so. Existing control and reporting systems were thoroughly revamped, and a new communication system was also provided.

The IADS upgrade had Hughes providing a control and reporting center (located at Keflavik Naval Air Station), an alternate control and reporting center co-located with the Iceland software support facility, and a voice and digital system providing on-island and off-island communications. There are two connectivity paths (one with EMP protection) to improve communications survivability. The Iceland post and telecommunications

authority controls both the primary fiber-optic and secondary microwave links. Existing air defense systems neighboring Iceland (US, Canada, Norway, and the UK) are being networked into IADS, serving to link together the North American air defense net with NATO's NADGE (NATO Air Defense Ground Environment).

Hughes used a new-generation, open system architecture (partially distributed) which facilitated upgrade efforts. DEC commercial computers form the base of the data processing equipment on which the Ada standard DoD computer language is hosted. Hughes also supplied operator workstations based on its AMD-44, which incorporate a Sony full-color, high-resolution 20"x20" (four million pixels) display. Mission software is handled by two DEC VAX 6410 computers, and communications data processing is handled by three Microvax 3800 computers. HAVE QUICK II secure radios and one VHF system handle ground-to-air communications, while a US\$27 million option for JTIDS Class 2H terminals will supply secure voice and digital datalinks.

Program Review

Background. IADS is a USAF-managed, NATO infrastructure program, to upgrade Iceland's air defense capabilities. It is part of the CINCLANT/SACLANT North Atlantic Defense Systems (NADS). The US is acting as Host Nation on behalf of Iceland, but the US contributes only 20 percent of the cost of IADS, with the balance being supplied by NATO. US funding for program office and systems engineering support activities is provided under US Air Force (USAF) budget line item PE#0102411F - North Atlantic Defense System (project 2980). Control and Reporting Center (CRC) improvements and new air surveillance radar are NATO infrastructure funded.

Iceland, while a member of NATO, neither maintains a military force nor has a military budget. The US provides for Iceland's defense under a 1951 bilateral agreement. A 1985 reorganization made Iceland's Division of Defense a department within the Foreign Ministry, in order to deal with military analyses and to participate in NATO military committees.

IADS is a phased program. The original implementation program, consisting of two phases (I & II), is now being complemented by a major upgrade effort. Phase I, the Interim Automated Air Defense System, which included both NATO and FY87 US funding, reached its first important landmark with NATO's approval of funding in June 1986. Contractors in the USA and 15 other NATO nations were invited to submit bids for Phase I that began in September 1986. Hughes (now Raytheon) was awarded the major contract for Phase I, including US US\$8.8 million for the Iceland Regional Operational Control Center (ICEROCC). As a temporary configuration, refurbished FPS-93 radar (taken from those replaced by FPS-117 radar in the Alaskan SEEK IGLOO surveillance radar upgrade program) were installed together with a command control center duplicating one installed in Hawaii.

GE was awarded a US\$62.4 million contract to supply four FPS-117 radar in July 1987. GE was the only company to respond to the USAF solicitation. While technically part of the IADS upgrade scheduled to be handled by Hughes, the radar were installed earlier than the rest of the upgrade, and tied into the interim system as installation was completed.

The ICEROCC, established at Rockville near Keflavik, utilized hardware and software identical to that used by the US, the Canadian Joint Surveillance System (JSS), and specifically the Regional Operational Control Center (ROCC), including the latest upgrades, in

Hawaii. The relative complexity of the ICEROCC is indicated by its 12 operator consoles. Other equipment delivered in Phase I included FYQ-47 digitizers to support the interim FPS-93 radar.

The fact that the ROCC equipment had already been designed and required no major modification caused delivery time to be halved from that normally required for an air defense system. Phase I was consequently completed in 1988. At the conclusion of this program phase, stations in Iceland were able to track aircraft in near real time. In some cases, information on unidentified aircraft reached the operations control center in one quarter of the time previously required.

The IADS Phase II effort included the Iceland Command and Control Environment (ICCE) development, which was completed in mid-1989. ICCE was implemented to improve links between the ground based elements of IADS and AWACS surveillance aircraft, including VHF and UHF radios and a new ROCC/ AWACS Digital Information Link (RADIL).

Hughes won a major contract for the overall upgrade of the IADS in April 1990. As previously indicated, by means of this upgrade, Hughes was essentially supplying a new system to replace the existing equipment it installed in 1988 as an interim measure.

Hughes won the upgrade program with a bid of US\$71.9 million, the lowest compliant bid. This meant a savings of about US\$100 million for NATO, which had set aside US\$177 million for the contract. Hughes' low bid was viewed askance by some of the competitors, but apparently Hughes was as much interested in the experience to be gained from the project as any potential profit. In September 1992, Hughes was awarded a US\$21.5 million face-value increase to the original contract to update the IADS Data Link Interface. This stretched the completion date of the originally scheduled 66-month program from September 1995 to October 1996. In November 1994, Hughes was awarded an increase to its base FFP contract of US\$6,496,000 for hardware and software to support interim IADS communications between the Iceland Command reporting Center and the USN Communications Center. This later supplement was not expected to affect the schedule.

In other program-related awards, Whittaker Electronics Systems was awarded a US\$0.455 million contract for systems engineering changes in November 1991. The award was increased by US\$0.149 million for additional engineering support in June 1992.

The IADS schedule placed the completion of the Hughes upgrade in October 1996. Later, in October 1997, IADS was turned over to the Air Combat Command for operational status. It appeared that this was the relative end of major funding and activity on the IADS project; however, in FY98 and FY99, some occurrences changed the future of the IADS again. It was reported to have performed for eight months in an operational environment before being officially accepted into service in September 1999. Additionally, in July 1999, NATO was reported as having agreed to upgrade the IADS to include Link 16 communications capability.

Latest Information. In July of 1999, NATO approved full program funding for implementation of a Link 16 capability for the North Atlantic Defense System in Iceland (approximately US\$28 million). As the host nation in Iceland, the United States will be responsible for funding the system engineering and integration activities. In 2000, the US Air Force provided, under PE 0102411F, US\$2 million for program and management and technical support for Link 16 communications capability.

Funding

This is a USAF-managed NATO infrastructure program funded primarily by NATO. The US funding is as follows:

US FUNDING

	<u>FY00</u>		<u>FY01(Req)</u>		<u>FY02 (Req)</u>	
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
<u>RDT&E(USAF)</u>						
PE#0102411F						
North Atlantic Defense System						
(NADS)		- 2.0	- 0	- 0		

All US\$ are in millions.

Source: US Department of the Air Force FY2002 RDT&E Summary

Note: While there is no further funding allocated under the US NADS program element, NATO's July 1999 approval of the Link 16 upgrade is likely to prolong program activities. Since the US is the host nation of Iceland, it is expected the US will be responsible for funding system engineering and integration activities under the Link 16 upgrade. It is unknown if funding will be allocated under PE#0102411F, or if a new PE number will be used for the Link 16 IADS upgrade.

Recent Contracts

<u>Contractor</u>	<u>Award</u> <u>(\$ millions)</u>	<u>Date/Description</u>
unknown	28.0	NATO has reportedly approved a US\$28 million upgrade to IADS. This upgrade is to install Link 16 communications ability to the IADS network. Contract is not yet known to have been awarded.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Jun	1986	NATO funding approved for Phase I (four 3-D radar)
Sep	1986	Phase I Invitation For Bid released to USA and NATO
Jul	1987	GE awarded Phase I radar contract
	1987	NATO funding approved for Phase II (control center)
Apr	1988	Interim system accepted by USAF
Apr	1990	Hughes awarded contract for IADS upgrade
	1991	First FPS-117 installed
Nov	1991	Whittaker awarded contract for engineering changes
	1992	All four FPS-117s scheduled to be installed in original plan
Oct	1996	Hughes upgrade contract to be completed
Oct	1997	IADS turned over to the Air Combat Command for operational status
	1998	IADS accepted for service after final testing
July	1999	NATO authorized a US\$28 million upgrade to IADS
	2000	The US Air Force provides US\$2 million for program and management and technical support for Link 16 communications capability

Worldwide Distribution

This is a one-of-a-kind integrated system with unique application in **Iceland**.

Forecast Rationale

The Iceland Air Defense System (IADS) is a United States Air Force-managed, NATO infrastructure program, to upgrade Iceland's air defense capabilities. IADS gives Iceland the ability to communicate with NATO Airborne Early-Warning Surveillance and Control (AWACS) aircraft.

In July of 1999, NATO approved full program funding for the implementation of Link 16 capability for the

North Atlantic Defense System. The amount of funding NATO approved is approximately US\$28 million. As the host nation in Iceland, the United States will be responsible for funding the system engineering and integration activities. At this time, no funds have been actually allocated for the Link 16 upgrade. Forecast International will analyze the developments of IADS Link 16 modernization as they arise.

Ten-Year Outlook

NATO has reportedly approved a US\$28 million Link 16 IADS upgrade; at this time however, no contract for this upgrade is known to have been awarded. Since no current IADS funding is known, and since the Link 16 contract does not yet seem to have been awarded, this chart has been omitted.

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