

**National Oceanic and Atmospheric Administration (NOAA)
National Environmental Satellite, Data, and Information Service (NESDIS)
Search and Rescue Satellite Aided Tracking (SARSAT)
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Operational Analysis
2007**

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Executive Summary

The Search and Rescue Satellite Aided Tracking (SARSAT) program uses NOAA’s polar-orbiting and geostationary satellites, along with satellites provided by other countries, to detect and locate emergency beacons carried by mariners, aviators and land-based users. The distress alerts are then relayed to Rescue Coordination Centers (RCCs) operated by the U.S. Air Force (USAF) and U.S. Coast Guard (USCG) or to search and rescue services in other countries. This operational analysis (OA) is an annual, in-depth review of the program’s performance based on the following:

- Customer Results
- Strategic and Business Results
- Financial Performance
- Innovation

This report focuses on the operational state of the program as of December 31, 2007, and is based on guidance developed by the Department of Commerce. The SARSAT program directly facilitates NOAA’s Strategic Goal to "Support the Nation’s Commerce with Information for Safe, Efficient and Environmentally Sound Transportation." The current program meets established cost, schedule and performance parameters.

1.0 Customer Results

The SARSAT program is fully meeting the customer’s needs and the program is delivering the services that it is intended to deliver. In 2007 the program contributed to the rescue of 353 persons in and around the United States. This is the largest number of lives saved for the SARSAT program in recent years and is a 30% increase over 2006 when 272 lives were saved. In all, the SARSAT program helped rescue more than 1,100 persons worldwide in 2007.

Figure 1 describes the logic model employed by the program to determine its outputs and outcomes. SARSAT provides all required outputs and continues to reach its customer focused outcomes.

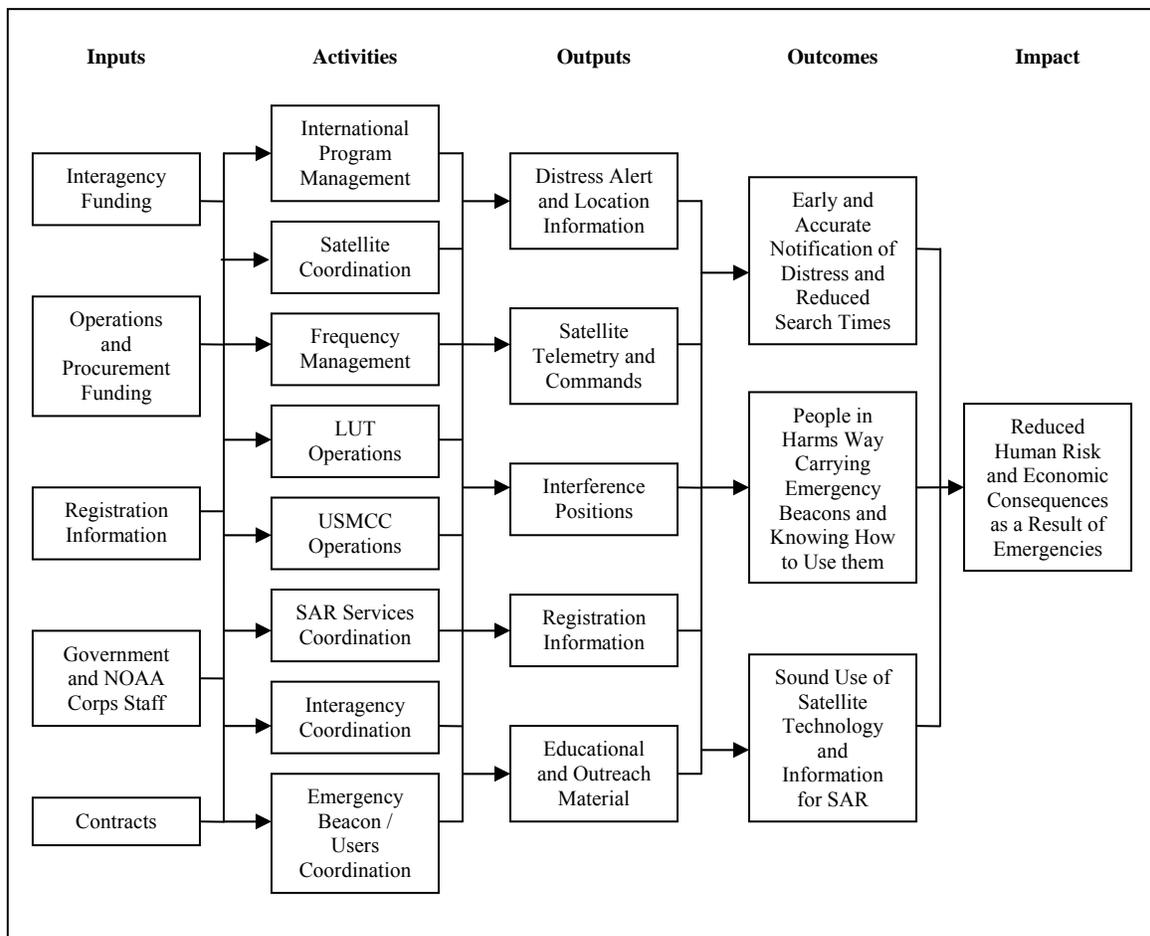


Figure 1: SARSAT Logic Model

The SARSAT program delivers in excess of \$250M in net benefits on an annual basis. The costs include not only those incurred by NOAA but also the search and rescue costs of the USAF and the USCG. Benefits are calculated based on lives saved and property protected. Other relevant drivers for the SARSAT program include:

- Commercial fishing is ranked one of the most hazardous occupations in the United States according to the Bureau of Labor Statistics with 150 deaths per 100,000 workers. Commercial fishing vessels are thus required to carry a 406 MHz Emergency Position Indicating Radio Beacon (EPIRB).
- All commercial vessels 300 gross tons or larger and all passenger vessels carrying 6 or more persons are required to carry a 406 MHz EPIRB.
- The State of Hawaii further requires all vessels operating more than 1 mile of shore to be equipped with a marine VHF-FM radio or 406 MHz EPIRB.
- Approximately 600 lives are lost annually prior to the U.S. Coast Guard being notified about the distress – the use of emergency beacons could help to reduce that number.
- General aviation has a large user community with more than 200,000 aircraft, 600,000 pilots and 31M hours flown annually – almost all aircraft are equipped with emergency beacons.
- The use of Personal Locator Beacons (PLBs) is proliferating within civilian and military applications. PLBs are increasingly used in recreational activities (boating, hiking, etc.), carried by personnel working in remote environs, and among the military services including U.S. and allied troops engaged in the Global War on Terrorism (GWOt).

The value of this program in terms of lives saved, the drivers listed above, and the net benefits gained mandates a continued need for investment in the SARSAT system.

1.1 Customer Requirements and Costs

The primary customers for the SARSAT program are the USAF and the USCG who have responsibility for inland and maritime search and rescue coordination respectively. The customer's needs are summarized in the SARSAT Operational Requirements document which is generated by an interagency Joint Working Group (JWG), endorsed by the SARSAT Program Steering Group (PSG), and validated by the National Search and Rescue Committee (NSARC). The JWG and PSG are established by an interagency Memorandum of Understanding and the NSARC is a standing, inter-Departmental committee established to set search and rescue policies for the United States.

The current SARSAT program supports the customer's requirements and based on current analysis the cost to the customer is as low as it could be for the results delivered. Two sets of performance measures track the SARSAT program's performance in this area: (1) performance measures from the customer's perspective are shown below in section 1.2 and (2) performance measures that track the customer's requirements (e.g., accuracy, timing, and availability) are discussed in section 2.

1.2 Performance Measures

Table 1 summarizes the baseline performance measures for the SARSAT program and the actual results from 2007. Other measures being developed or planned include “RCC Satisfaction Index,” and “Public Satisfaction Index.” These measures align with the “Customer Results Measurement Area” of the Performance Reference Model developed by the Federal Enterprise Architecture Program Management Office (FEA-PMO).

Table 1: Customer Results Performance Measure

| Measurement Area | Indicator | 2007 Baseline | 2007 Actual Result | Comments |
|-----------------------|---------------------------------|---------------|--------------------|--|
| Customer Requirements | Percent of Beacons Registered | 77% | 74.56% | The percentage of total beacon activations in the US that were registered. Baseline performance was not met in 2007 due, primarily, to low registration rate for ELTs. The Program has implemented a corrective measure to increase the percent of registered beacon alerts for 2008 by setting this as a basis for award term under the new O&M contract. |
| | Accuracy of Registration Data | 78% | 83.7% | The accuracy of contact information provided to the RCC. |
| | Usefulness of Registration Data | 66% | 67.7% | The percentage of cases where registration information was the primary means used by the RCC to resolve a case. |
| | False Alert Rate | ≤ 2.75% | 1.98% | Estimated percentage of distress beacons which are activated in a non-distress situation as compared to the total beacon population. Final figure is dependent on the total number of beacons used by the military; data is provided by DOD in the spring. |

2.0 Strategic and Business Results

The SARSAT program is meeting its own goals and objectives as well as those of the agency. Program management and controls are in place to ensure the program continues to meet its goals and objectives and monitor how well the SARSAT program performs.

2.1 SARSAT Helps to Achieve Strategic Goals

The SARSAT program directly facilitates NOAA’s Strategic Goal to “Support the Nation’s Commerce with Information for Safe, Efficient and Environmentally Sound Transportation.”

Specifically, the SARSAT program meet's NOAA performance objective of reducing human risk, environmental and economic consequences resulting from emergencies.

The SARSAT program helps achieve NOAA's goals by collecting and relaying reliable and accurate distress signals via NOAA and non-NOAA satellites in a timely manner, coordinating on national and international matters relating to satellites, spectrum management, and search and rescue, maintaining a national 406 MHz beacon registry, and serving as the lead for the SARSAT program in the United States.

The SARSAT program also supports the Department's priority mission essential function of "Providing control and timely access to global data from satellites and other sources to promote, protect, and enhance the Nation's economy, security, environment and quality of life."

2.2 Business Results

2.2.1 Program Management and Controls

The SARSAT program is currently guided by a series of international and interagency agreements which serve as the program management documentation and describe the relationship between the performance of the system and overarching guidance. Annex A provides a brief summary of agreements which serve as drivers for the SARSAT program. Detailed national and international level management controls are documented at Annex B.

The SARSAT program is managed at the NOAA, national and international levels using a combination of matrix management, standing committees and working groups. Within NOAA, the SARSAT program is part of the Emergency Response (EMR) matrix program (a part of the Commerce and Transportation Goal). The overall Emergency Response program manager is responsible for developing funding plans, approving all program expenditures at a high level and managing the program's cost, schedule and performance. The Commerce and Transportation Goal is responsible for developing an Annual Operating Plan (AOP) which follows NOAA program guidance and ensures that the investment continues to be aligned with the agency's strategic goals. A detailed baseline of annual activity is contained in the AOP which is approved by NESDIS and the NOAA Program, Planning and Integration (PPI) office. A FY08 AOP has been developed for the EMR program.

The SARSAT Program Plan was updated in March 2007 by the Office of Satellite Data Processing and Distribution (OSDPD) which is responsible for the execution of the program and the Office of Response and Restoration (ORR) which is responsible for program management. The SARSAT Program Plan outlines NOAA's national and international agreements responsibilities and is approved by the agency and at the interagency level by the SARSAT PSG.

2.2.2 Monitoring Cost, Schedule and Performance

Cost - Monthly budget reviews are held with the program manager, Contracting Officer's Representatives (CORs) and contract managers to ensure contracts are within cost and on schedule.

Monthly reports containing financial information such as estimated and actual costs, contract ceilings, and estimated cost to complete are required from the contractors. This information ensures that the Government has the information it needs to evaluate cost performance. Microsoft Excel is used to track budget/spending information. Current costs are reported in section 3.1.

Schedule – The AOP is also used to track key milestones. In 2007, the SARSAT Program met several key operational milestones which included:

- Awarding the SARSAT U.S. Mission Control Center Contract for operations, maintenance, and technical support;
- Completing the Privacy Impact Assessment for the SARSAT 406 MHz Beacon Registration Database (RGDB) [http://www.cio.noaa.gov/itmanagement/PIA_SARSAT_010407.pdf]
- Conducting a Continuity of Operations (COOP) Exercise
- Completing a site survey for the new Medium-altitude Earth Orbiting Local User Terminal (MEOLUT) which will be installed at the USCG Communications Station Hawaii. The survey included a suitability assessment for the antennas/equipment that will be on site.

One key milestone that was not met in 2007 is related to the delay of the move of the backup U.S. Mission Control Center (USMCC) from the primary contractor's premises in Lanham, MD to the NOAA Critical Infrastructure Protection (CIP) site at Wallops Island, Virginia. The delay, which was first reported in the 2006 OA, is a continued result of required communication lines not being available. There is no operational impact from not completing this milestone. The infrastructure is expected to be installed by the 2nd quarter of FY08 at which time the backup USMCC will be moved.

Performance – A formal SARSAT performance management plan is being finalized by the SARSAT Program Steering Group. The current version includes an evaluation of all the performance metrics, rationale for why the measure is important, the persons held accountable for the measure, and the collection and reporting methods associated with each measure. The performance measures are reported through the SARSAT Operations Manager on a monthly basis and circulated to management and customers.

In addition, a quarterly quad chart summarizing cost, schedule, and performance for the NOAA's Emergency Response program is submitted to PPI.

2.3 Reviews

As part of the NOAA program structure, the SARSAT program is reviewed on an annual basis. This took place as part of the FY10 budget cycle and was completed in August 2007. A Program Operating Plan for the Emergency Response program (of which SARSAT is a component) was reviewed by NOAA's Office of Program Analysis and Evaluation and the PPI office. The SARSAT program continues to align with NOAA's strategic goal of supporting the Nation's commerce with information for safe, efficient and environmentally sound transportation. Specifically, the SARSAT program meets the NOAA performance objective of reducing human risk, environmental and economic consequences resulting from natural or human-induced emergencies by saving lives and property.

Also in 2007, a Management Control Review (MCR) of the SARSAT Configuration Management (CM) process was conducted. The MCR is used to assess the internal control tools (organization,

policies, and procedures) that assist managers in achieving results and safeguarding the integrity of their programs. This evaluation was conducted on the two components of the operational SARSAT System -- the United States Mission Control Center (USMCC) and the Local User Terminals (LUTs). The CM processes for both were reviewed and audited based on compliance with DOC and NOAA policy, NIST guidelines for CM, and industry best practices. A report was prepared that addressed the scope and methodology for conducting the MCR as well as provided the resulting findings and recommendations. Progress toward correcting any deficiencies identified in the MCR will be tracked and reported to NESDIS on a quarterly basis.

2.4 IT Security

As a critical information system, SARSAT is accredited under requirements spelled out in NOA 212-13 (08/06/90) and DOC Information Technology Security Policy that are based on OMB and NIST guidance. System Security Plans, Risk Assessments, and Contingency Plans were certified and approved for SARSAT in July 2005. Management, operational, and technical security controls are adequate to ensure the confidentiality, integrity and availability of information.

In response to a report issued by the Inspector General (IG) the SARSAT program is finalizing its E-authentication procedures to ensure that emergency beacon registration information is properly protected. A cost-benefit analysis was conducted in 2007 to assess the tradeoffs between implementing the IT security controls versus the cost to the general public. The program is on schedule to meet the IG recommendations and is being completed as part of the Plan of Action & Milestones (POAMs).

Also in 2007, the program initiated the procedures to achieve Certification & Accreditation (C&A) for the SARSAT system. This included conducting a Facilitated Risk Assessment (FRA), a Security Test & Evaluation (ST&E), and developing a System Security Plan. The assessment resulted in the development and prioritization of draft POAMs. Approved C&A is expected in February 2008.

2.5 Performance Measures

The performance measures in Table 2 show the SARSAT program's performance with respect to Strategic and Business Results. These measures align with the "Mission and Business Results Measurement Area," "Processes and Activities Measurement Area" and the "Technology Measurement Area" of the Performance Reference Model developed by the FEA-PMO.

Table 2: Business Results Performance Measures

| Measurement Area | Indicator | 2007 Baseline | 2007 Actual Result | Comments |
|--------------------------------|-------------------------------|---------------|--------------------|----------|
| Strategic and Business Results | Timeliness of Distress Alerts | 91% | 94.8% | |
| | Accuracy of Distress Alerts | 91% | 95.32% | |
| | Availability of System | 98% | 99.8% | |

| Measurement Area | Indicator | 2007 Baseline | 2007 Actual Result | Comments |
|------------------|--------------------------------------|---------------|--------------------|---|
| | Currency of Registration Database | 75% | 70% | Baseline performance was not met in 2007 due, primarily, to the large number of new beacons that are replacing older models yet not being updated or taken out of service by the beacon owner(s). The Program has implemented a corrective measure to improve database currency for 2008 and has set this as a basis for award term under the new O&M contract. |
| | Use of On-line Registration Database | 40% | 63% | |

2.6 Other Satellite Alerting Source Organizations

An analysis of alternatives demonstrates that there are no other organizations currently capable of doing this work better, more efficiently, or at lower cost. Because the relay of distress signals is customarily free under international law, and by national policy, there is generally no economic feasibility as a commercial venture.

Inmarsat was providing a distress alerting function for vessels under the Global Maritime Distress and Safety System (GMDSS), however, its coverage was limited and the number of users low due to the high cost of the service. Inmarsat was privatized in 1999 and in 2004 it decided to stop the relay of distress signals as it was no longer economically viable. Inmarsat stopped providing the distress alerting service in 2006 and replaced their emergency beacons with ones that work with SARTSAT.

The Iridium system is currently the only other global satellite system that offers comparable capabilities to SARTSAT. However, it along with most other satellite phone systems is relatively expensive in terms of user equipment and the subscription cost. This, along with a lack of a coordinated ground communication network to deliver distress alerts and robust operational requirements, limits the use of satellite phones to specialized users.

An emerging technology that may one day be able to perform distress alerting and locating capability similar to SARTSAT is the SPOT Satellite Messenger. When activated, SPOT acquires its coordinates from the GPS network and sends that location along with a distress message to the GEOS Emergency Response Center. The Emergency Response Center then notifies the appropriate emergency responders based on the location of the messenger and personal information provided. Unlike SARTSAT, however, SPOT relies upon the Globalstar LEO constellation's simplex (one-way) system which, due to the constellation's low inclination, does not provide global coverage. In addition, SPOT requires an annual service-fee for its users whereas SARTSAT emergency beacons do not.

3.0 Financial Performance

3.1 Current Performance vs. Baseline

The current SARSAT financial performance, as shown in Figures 2 and 3, compares actual cost of the program compared to a pre-established cost baseline (i.e., annual spend plan). Program costs consist of labor and benefits for full time permanent staff dedicated to SARSAT, travel, communications, supplies and equipment, contracts, and corporate overhead. NOAA funds are supplemented by reimbursable funds from the USAF and USCG to support contracts. Financial performance information is provided for fiscal year 2007 (Figure 2) and the first quarter of fiscal year 2008 (Figure 3).

Actual costs for fiscal year 2007 were 9% less than budgeted costs and the actual costs for the first quarter of fiscal year are 10% less than budgeted costs. Differences in these costs included funds for the transition phase in the USMCC Operations & Maintenance contract which were not realized due to the incumbent being awarded the new contract. In addition, the actual costs to host the Cospas-Sarsat 25th Anniversary Reception and Council Meeting were below the planned cost.

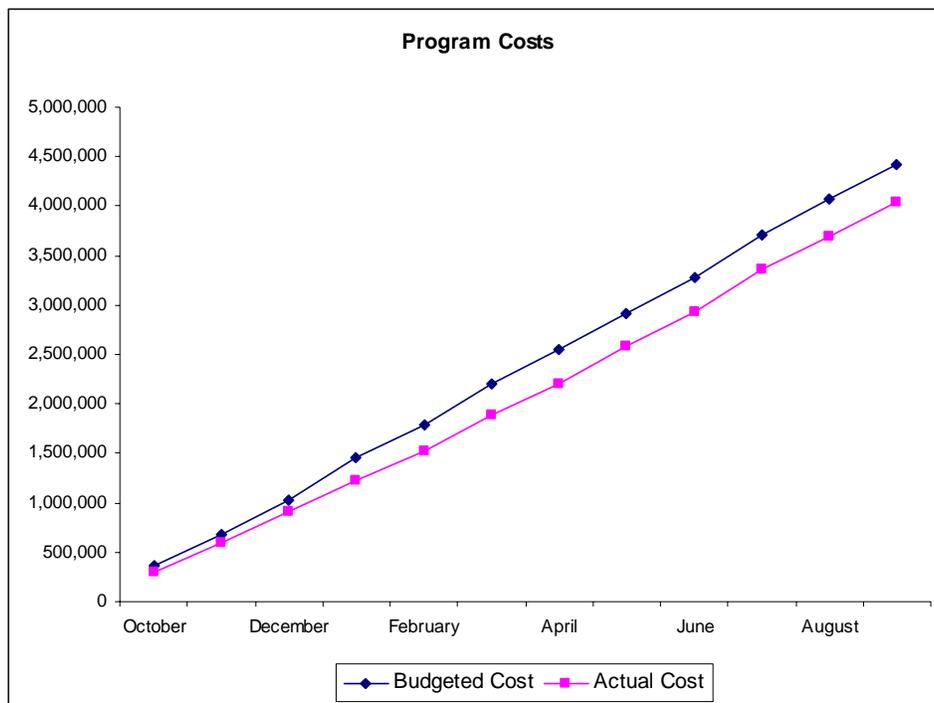


Figure 2: FY07 Budget vs. Actual Costs

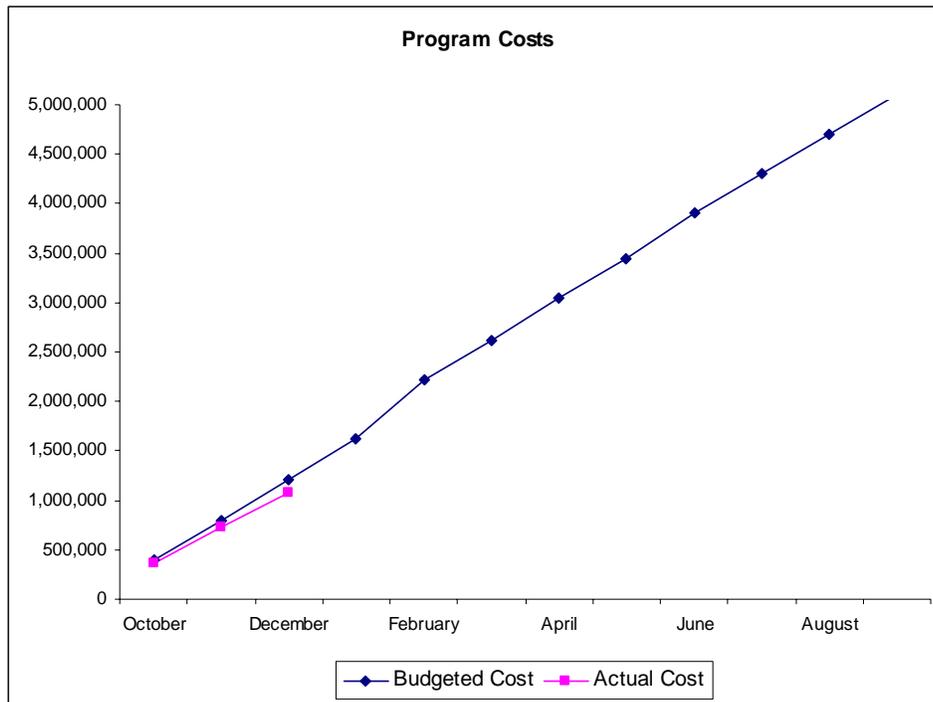


Figure 3: FY08 (1st Quarter) Budget vs. Actual Costs

3.2 Performance Measures

Financial Performance Measures being developed include “Program Cost Index,” and “Registration Cost Index.” In addition to these performance measures, the SARSAT program is developing a high-level, long term corporate performance measure. These measures will evaluate the extent to which the program achieves its outcome-oriented objectives and its effectiveness. The measures will also evaluate the overhead cost of the program and system for each life rescued as a result of SARSAT. In 2007, the baseline and targets were developed in coordination with the USCG and USAF and data from each agency is currently being gathered.

3.3 Cost Benefit Analysis

An analysis of the socio-economic benefits, or the cost-benefit analysis, of the SARSAT program was last completed in 2006. The analysis provides an economic perspective and helps determine present and future impacts of SARSAT activities as well as help identify beneficiaries of the system. The cost-benefit analysis also helps develop the documentation necessary to support future decisions on the program. The analysis concluded that for every Federal dollar spent on the program the Nation derived more than 11 dollars in benefit, and the net benefit was in excess of \$250M.

3.4 Financial Performance Review

Financial performance is typically subjected to a periodic review for reasonableness and cost efficiency. Monthly budget reviews are held with the program manager, CORs and contract managers to ensure contracts are within cost and on schedule. Monthly reports from contractors are required to ensure the Government has the information it needs to evaluate cost performance. A detailed review of work and priorities is undertaken if cost is significantly above base lined values. Also, any necessary corrective actions are also identified and implemented.

4.0 Innovation to Meet Future Customer Needs

The following projects have been implemented in 2007 to address future challenges, better meet customer needs, make better use of technology, and lower operating costs.

4.1 Beacon Registration

The SARSAT Program has been registering 406 MHz emergency beacons since 1990. Prior to the National Beacon Registration Database (www.beaconregistration.noaa.gov) being made available online in 2003, all registration correspondence was handled in paper form. New registrations and updates to registrations were either mailed or faxed in and then manually keyed into the database and National Archives and Records Administration (NARA) requirements have required the SARSAT Program to maintain these documents on file. And while beacon owner use of the online database has dramatically increased, there are still hundreds of registrations submitted to the SARSAT program in paper form each year. As a result, the SARSAT program has tens of thousands of registration records on hand. This represents a significant logistical burden to properly care for and house these documents.

In 2007, the SARSAT program evaluated the capability to scan all the legacy paper registrations into electronic form. A vendor was selected to conduct testing and evaluation for e-scanning. After several different trial runs, the vendor failed to implement a successful solution and the contract was terminated. The SARSAT program will continue to investigate a means for electronic scanning in order to reduce the overhead associated with maintaining such a large collection of paper registrations.

4.2 Changing Space Segment

The European Union (EU), Russia and the United States continue to investigate the use of search and rescue instruments on medium-altitude earth orbiting satellites which have the potential to significantly reduce waiting time and improve location accuracy. These efforts, however, continue to present the following challenges:

- How will we coordinate with the European Union and Russia on future space segments?
- How will we integrate this new data into the existing system?
- What will be the structure of the program after the new systems are operational?

Project to Address Challenge: *Planning for new space segment capabilities.*

Since the United States, Russia and the European Union are all planning for a search and rescue capability on future global navigation satellite systems (GNSS), coordination is required to ensure compatibility with the existing Cospas-Sarsat system and interoperability among the various systems. In 2007, Cospas-Sarsat signed the “*Declaration of Intent to Cooperate*” with the European Galileo Joint Undertaking (GJU) that outlines the responsibilities of the two parties and modalities associated with the planning, proof-of-concept and demonstration and evaluation of the future medium-altitude orbiting search and rescue (MEOSAR) systems and ensure long-term space segment plans to ensure continuity of effort.

The SARSAT program continued its participation 2007 in a working group with the Russian Space Agency which focuses on coordinating interoperability issues between the future GPS-based and Glonass-based search and rescue systems. The working group met at the Glonass facility in Krasnoyarsk, Russia in June 2007.

Also in 2007, the program continued to work with the USAF on further refining the requirements for a search and rescue instrument on future GPS satellites. These requirements are detailed in a Capability Description Document (CDD) for the MEOSAR system to be known as the Distress Alerting Satellite System (DASS). The CDD is required to be approved by DOD before detailed planning on the capability can be initiated.

Project to Address Challenge: *System Integration.*

In preparation for these new systems the SARSAT program has been working on a number of projects to develop the ground systems to process alert data from the MEOSAR satellites. In 2007 an extensive series of risk reduction activities has been undertaken with the goal of defining key performance parameters and system attributes for an operational MEOSAR ground segment. These activities included extensive real-time testing with suitably equipped GNSS satellites in an effort to evaluate operational margins for various segments of both the space to ground segments. Further supplemental testing using multiple Geostationary Earth Orbiting satellites was conducted to evaluate the geo-location algorithms used for alert processing. The result of these activities has allowed the procurement effort for key components of the MEOSAR ground segment to proceed on schedule. The purchase, installation, and acceptance of these main components of the MEOSAR ground segment is expected to be completed by early 2010, and parallel testing with the operational system will then commence. Upon successful completion of the parallel testing, it is anticipated that the risks associated with incorporating these new satellites into the operational SARSAT system will have been resolved.

The SARSAT program also worked with DOD and the State Department in 2007 on efforts to accept the Canadian Government’s offer to provide the SAR instruments on the Distress Alerting Satellite System (DASS). Cooperation with the Canadian Government is considered an important priority as it will continue Canada’s long-term association with the Cospas-Sarsat Program and will represent a significant cost-savings, if accepted.

Project to Address Challenge: *Future Program Structure.*

The new MEOSAR segments may also require a new program structure to effectively manage the system. In addition, Cospas-Sarsat is witnessing an ever-increasing user base and has been adding

additional participants (national administrations) to the current system's operation. To this end, the SARSAT program has been working with the international community to develop a long-term strategy to address these future challenges. In 2007, the SARSAT program participated in a Task Group to focus on the long term needs of the program and to begin development of a Strategic Plan. This Task Group will again meet in 2008.

4.3 Phase out of 121.5 MHz Satellite Alerting

The current capability to relay 121.5/243 MHz distress signals will be terminated on February 1, 2009. This means that the approximately 240,000 121.5 MHz users will have to transition to 406 MHz if they want to continue having satellite coverage. This effort will require significant outreach in order to educate as many users of the older 121.5 MHz beacon technology.

Project to Address Challenge: *121.5 MHz Phase Out Plan*

NOAA, along with the USAF, the USCG, and other organizations such as the Aircraft Owners and Pilots Association (AOPA) have developed a draft 121.5 MHz Phase Out Plan. The plan outlines educational, regulatory and legislative actions necessary to transition 121.5 MHz emergency beacon users to 406 MHz emergency beacons. To support the plan, NOAA has updated its SARSAT Outreach Plan which includes informing the public about the termination of 121.5 MHz satellite alerting. To support the Outreach Plan the program has continued to distribute informational pamphlets to educate users on why the transition is taking place and why the 406 MHz system is more advantageous.

In 2007, the program worked with the Federal Aviation Administration (FAA) on a mass e-mail campaign to inform pilots of the termination, the reasons behind the termination, and the need to transition to 406 MHz beacons. As a result of this effort, NOAA and the FAA were able to notify over 242,000 people who have subscribed to the FAA's Safety Program Airmen Notification System.

In addition, the SARSAT program continues to engage in other outreach initiatives including participating at air shows such as the AOPA Fly-In and the annual Oshkosh Air Venture which is the largest air show in North America and attracts more than 700,000 pilots and aircraft owners.

In order to gain a sense of the effectiveness of these outreach efforts, the SARSAT program is partnering with AOPA to measure how extensive the information campaign has been over the past few years. In 2007, the SARSAT program and AOPA created a survey that will be issued in early 2008 asking pilots and the general public on their level of knowledge about the impending termination of 121.5 MHz alerting and the need to transition to 406 MHz beacons.

4.4 Funding Levels

Recent trends in government spending indicate that agencies should not expect significant increases in their budgets. This, coupled with the requirement to accommodate more users and incorporate evolving technology, will force the program to find efficiencies and to do more with the same amount of resources.

Project to Address Challenge: *Securing Additional Interagency Funding*

Introduction of new MEOLUT system requirements and increased IT security requirements are among some of the new drivers which have placed a greater fiscal demand on the SARSAT program.

Based on testing conducted by NASA and input provided by industry to a Request for Information solicitation the operational MEOLUT that is to be installed in Hawaii necessitates a larger number and size of antennas than original studies indicated. This will require that the SARSAT program have the added resources to procure the additional antennas. In addition, high-impact systems like SARSAT require strict adherence to IT security guidelines and best practices. Ensuring this level of security, however, presents a financial burden on system operations and the technology necessary to support it.

Realizing these challenges, the SARSAT program worked with its interagency partners in 2007 to secure an increase in interagency funding. This additional funding will not only help secure the long-term success of developing the MEOLUT component which will be necessary to process alerts from future MEOSAR systems but will also help the SARSAT program meet the ever-increasing IT security requirements.

Annex A

International Cospas-Sarsat Programme Agreement – 1988

The *International Cospas-Sarsat Programme Agreement* was signed by the Canadian Ambassador to France who signed on behalf of Canada, the Russian Deputy Ambassador to France on behalf of the former USSR, a representative of the French Foreign Ministry on behalf of France and the NOAA Administrator on behalf of the United States. It was developed to:

- assure the long term operation of the Cospas-Sarsat System;
- provide distress alert and location data on a non-discriminatory basis;
- support the objectives of the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) concerning search and rescue; and
- define the means by which the Cospas-Sarsat System is to be managed.

In addition, the Agreement describes the components of the System, the roles of the Parties to the Agreement, the management structure of the Program, and the roles of other States or organizations involved with the Program.

As part of the agreement the United States, and specifically NOAA as the cooperating agency, is responsible to fulfill the responsibilities as a Party, a Space Segment Provider, and a Ground Segment Provider.

Memorandum of Agreement Concerning the SARSAT Space Segment - 1995

The Memorandum of Agreement Concerning the SARSAT Space Segment was signed by the Deputy Chief of the Canadian Mission to the United States, the French Ambassador to the United States, and the NOAA Administrator. It was developed to establish the means by which the Parties to the Memorandum of Agreement would manage the SARSAT space segment consistent with their obligations under the International Cospas-Sarsat Programme Agreement.

As portions of the SARSAT payload on the United States NOAA spacecraft are provided by the Governments of Canada and France, the agreement identifies the responsibilities and roles of the Parties as it relates to the provision of different components of the SARSAT payload and the platform or spacecraft on which the payload operates.

The SARSAT Project Plan constitutes the main instrument for the implementation of the SARSAT Memorandum of Agreement. It describes in detail the SARSAT payload design, procurement, integration, testing, commissioning and operation.

The SARSAT Telemetry and Command Procedures document contains the detailed procedures involved with exchanging satellite telemetry and instrument commands.

This agreement and the supporting plans and documents identify the responsibilities of NOAA, NESDIS and the DSD in its role as a Space Segment Provider.

United States National Search and Rescue Plan - 2007

The United States National Search and Rescue Plan (NSP) identifies the roles of the signatory agencies in providing SAR services consistent with national policies and international commitments.

The Plan provides for the coordination of SAR operations, effective use of available resources, mutual assistance, and efforts to improve cooperation.

The Department of Commerce participates in and supports SAR operations through NOAA. NOAA has the responsibility to provide satellite services for detecting and locating aircraft, ships or individual in potential or actual distress. The Department of Homeland Security, through the USCG, develops, establishes, maintains and operates rescue facilities for the promotion of safety on, under and over international waters and waters subject to U.S. jurisdiction. The Department of Defense provides facilities and other resources that are used to support civil SAR needs on a not-to-interfere basis. NASA supports SAR objectives through research and development or application of technology to search, rescue, survival, and recovery systems and equipment, such as location tracking systems, transmitters, receivers, and antennas capable of locating aircraft, ships, spacecraft, or individuals in potential or actual distress.

In 2007, a new version of the NSP was distributed and signed by the Secretaries of Commerce, Homeland Security, Transportation, Defense, Interior, the Administrator of the National Aeronautics and Space Administration, and the Chairperson of the Federal Communications Commission. The SARSAT program, as the DOC representative to NSARC coordinated the signing of the NSP by Secretary Gutierrez.

Memorandum of Understanding regarding responsibilities for the United States Cospas-Sarsat System - 1998 (extended in 2003)

The Memorandum of Understanding (MOU) regarding responsibilities for the United States Cospas-Sarsat System was signed by the Assistant Administrator for Satellite and Information Services of NOAA, the Associate Administrator for Space Flight for NASA, the Director of Operations Policy for the USCG, and the Director of Aerospace Operations for the Air Combat Command for the USAF. The latest version went into effect in 1998 and was extended in 2003. The memorandum defines the roles, responsibilities, and financial obligations of the four United States agencies involved with the implementation of the Cospas-Sarsat Program at a national level.

In 2007, the SARSAT program began working with its interagency partners on the next version of the MOU. A significant piece of the new MOU will include the interagency implementation and development activities for the Distress Alerting Satellite System (DASS). The new interagency MOU is expected to be signed in 2008.

Annex B

The following management control processes are implemented at a national level:

Operational Monitoring - Automated tools exist to provide real time monitoring for the SARSAT system including the reference beacons, satellites, satellite receiving stations, the mission control center and all communications links. Significant problems are immediately brought to the attention of the management team. Primary focus of operational monitoring is to ensure that the performance baseline is met.

Daily Status Briefing – A daily briefing on the operational status of the SARSAT system is provided to the SARSAT management team. The briefing includes significant activity over the past 24 hours, availability of the system and major enhancements implemented. Primary focus of daily status briefings are to ensure that the performance baseline is met.

Bi-Weekly Status Meetings – Bi-weekly status meetings are held with contractor personnel to develop work plans, to track performance, to ensure work is progressing according to schedule, and to evaluate threats and opportunities.

Monthly SARSAT Staff Meetings – The SARSAT program staff have a meeting every month to ensure work is on schedule, to identify priorities for the program and to report status to management.

Monthly Configuration Control Board – A monthly configuration control board is held to review planned modifications to the SARSAT system and to review system problem reports. The configuration control board addresses aspects of cost, schedule and performance.

Monthly Budget Reviews – Monthly budget reviews are held with the program manager, CORs and contract managers to ensure contracts are within cost and on schedule. Monthly reports from contractors are required to ensure the Government has the information it needs to evaluate cost performance.

Quarterly Joint Working Groups – Interagency Joint Working Groups are held quarterly between the USAF, USCG, NASA, NOAA, FAA and FCC to provide a formal mechanism to forward agency (customer) issues that rise above the operational level. The Joint Working Group allows the development of requirements, coordination of SARSAT technical, operational and programmatic efforts and to coordinate positions for international meetings.

Bi-Annual Program Steering Group (PSG) –The PSG is comprised of the USAF, USCG, NASA and NOAA and monitors the programmatic value of the system to ensure that the work being performed meets NOAA's and partner agency's mission goals. The PSG also set the strategic direction for the program and coordinates major policy issues with other agencies. Lastly, the PSG develops a five-year budget for the program and identifies major system enhancements. The PSG is charged with overall cost and performance of the system.

Quarterly National Search and Rescue Committee (NSARC) – The NSARC is a standing inter-Departmental committee consisting of DOC, DHS, DOD, DOT, DOI, NASA and the FCC to coordinate and set national SAR policy

International management activities for the SARSAT program come under the purview of the Cospas-Sarsat Program and the following bodies:

Joint Committee – The Cospas-Sarsat Joint Committee is responsible for developing technical and operational requirements, coordinating the operations of the system including system configuration, developing and implementing enhancements and developing plans and procedures.

Cospas-Sarsat Council - The Cospas-Sarsat Council, by international agreement, is responsible for overall program management and sets policy for the organization. It also is responsible for implementing the international agreement, administering the Secretariat, managing the finances, and maintaining relations with States and other organizations.