

GAO

Briefing Report to the Honorable
Harry Reid, United States Senate

May 1987

CONTRACTING

Procurement of Lithium Batteries for Air Force Missile Systems



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United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-226834

May 20, 1987

The Honorable Harry Reid
United States Senate

Dear Senator Reid:

On January 14, 1987, you requested that we review the recent award of an Air Force contract to Altus Corporation for the production of lithium batteries for the Minuteman and Peacekeeper missile systems. More specifically, you asked us to ascertain whether

- Altus had the proven facilities to produce the batteries;
- Altus had undergone and passed qualification testing to become a second source producer for the batteries;
- the Air Force had conducted an on-site inspection of Altus' plant capability; and
- the Air Force had requested a report from the Defense Contract Audit Service on Altus prior to awarding the contract to Altus.

On March 9, 1987, we briefed your representatives on the results of our review. At that meeting we agreed to provide you this report.

BACKGROUND

Lithium batteries are used as emergency power sources for the Minuteman and Peacekeeper missile systems. The primary power sources are commercial electricity; the initial backup sources are diesel powered generators. In the event of failure of both electric and diesel power, the emergency battery power source can be used. Emergency battery power is provided by both lead acid batteries and lithium batteries. There are 10 or 12 emergency batteries located in each Minuteman or Peacekeeper launch facility. A lithium battery (or module) is made up of three lithium submodules, each of which is made up of three lithium cells (see app. I).

In the late 1970s, the Air Force initiated a program to extend the usable life of its emergency power sources. Under this program, called Minuteman Extended Survivable Power, the Air Force is replacing four or six lead acid batteries (depending on the silo configuration) with lithium batteries. This replacement significantly extends the usable life of the emergency power source, thus allowing the missile system to remain available for launch over a longer period of time.

The initial contract for the engineering and qualification of a lithium battery was awarded to GTE Sylvania, Inc., in March 1978. That effort, costing \$6.9 million, was performed at GTE's plant in Waltham, Massachusetts. In February 1982, a second contract for \$6.4 million was awarded to GTE with performance at Waltham, Massachusetts, and Henderson, Nevada. This contract was for the fabrication of lithium batteries for additional qualification testing and the purchase of material and tooling for producing the first 100 complete units. In August 1982, a third contract was awarded to GTE in Henderson, Nevada, for production of 250 lithium batteries. This contract included an option for the Air Force to buy an additional 642 batteries. The option was exercised. In June 1984, the contract was modified to buy an additional 270 batteries. The total cost of this third contract for 1,162 batteries was \$64 million.

Throughout this 6-year period, GTE was the only firm qualified by the Air Force to produce lithium batteries for the Minuteman and Peacekeeper missile systems. However, in January 1984, in order to obtain the lowest possible price, the Air Force decided to qualify another producer for the battery. At the time, the Air Force projected a continuing need for the batteries for both Minuteman and Peacekeeper missile systems. Eight firms indicated an interest in becoming a qualified producer, but the Air Force found that only one--Altus Corporation of San Jose, California--met its criteria. The Air Force's evaluation report, in part, said

"Altus has demonstrated experience with mil-spec [military specification] requirements and major weapon systems. Their existing facilities are known to be adequate for the planned production rates within the current schedule. Altus has fabricated and tested an 8,000 AH [amp-hours] battery and was the only resposdee other than GTE to meet this criteria."

In April 1984, the Air Force awarded Altus a \$2 million development and qualification contract. Altus became a qualified second source in April 1985.

In August 1985, the Air Force solicited bids for 180 lithium batteries for Peacekeeper missile silos. Proposals were received from GTE and Altus. GTE submitted the lower bid and was awarded a \$9.4 million contract in November 1985; Altus had bid \$10.7 million. The period of contract performance was November 1985 through August 1988, with deliveries scheduled from March 1987 through August 1988. According to Air Force officials, GTE completed its deliveries by December 1986. This accelerated schedule was permitted under the contract. Air Force officials said that the GTE plant needed to maintain a high level of production output for efficiency and that spreading lithium battery production over the full contract period of performance would have resulted in production inefficiency and increased costs to GTE.

In October 1986, the Air Force again solicited bids for the production of 332 lithium batteries for 50 Minuteman silos. Proposals were received from GTE and Altus. The Air Force awarded Altus a contract for \$14.5 million in December 1986; GTE's bid was \$15.7 million. The period of performance is December 1986 through May 1991.

EVALUATION OF ALTUS' QUALIFICATIONS,
CAPABILITIES, AND PRICE PROPOSAL

According to Altus officials, the company has been producing lithium batteries both commercially and under contract to the military services since about 1977; it has had or currently has contracts with the Navy and the Army to produce lithium batteries. Its Navy contract requires it to produce lithium batteries with up to an 8,000 amp-hour capacity. While these batteries are smaller in size and

capacity than the 9,500 amp-hour batteries required for the Minuteman or Peacekeeper systems, Altus produced lithium batteries which exceeded the minimum specification requirement of 9,500 amp-hours during qualification tests. While some deviation from specifications was noted in the qualification test reports, Air Force officials stated that this was not significant enough to affect Altus' qualification as a second source producer.

Altus' capability to meet production requirements will be further evaluated by the Air Force during first article testing later this year. "First article testing," in this instance, means testing and evaluating the first battery for conformance with contract requirements before or in the initial stage of production.

Altus has not yet established its production line for the current Air Force contract. However, neither Air Force nor Altus officials anticipate any problems in Altus' ability to meet its contract requirement. Altus has about 4-1/2 years to deliver 996 lithium submodules (332 batteries).

Both Air Force and Altus officials stated that numerous visits were made by Air Force personnel to Altus' facility during the 1-year qualification period to assess the capability of the company to produce the lithium batteries and the progress of the qualification program. We reviewed limited documentation at the Air Force's Ballistic Missile Office that indicated that plant facility reviews had been made. Further, Air Force officials said that a full review of plant capability is planned as part of the first article test and acceptance process.

According to the contract negotiator, the Air Force did not request the Defense Contract Audit Service to evaluate Altus' price proposal prior to awarding the contract because such an evaluation was not required or needed. He added that the Air Force was able to confirm the reasonableness of Altus' price proposal by comparing it with prior GTE battery contracts.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our objective was to examine the adequacy of the Air Force's support for its decision to qualify Altus as a second source producer.

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We examined contract files at Air Force Headquarters and at the Air Force's Ballistic Missile Office, Norton Air Force Base, California, and we interviewed officials at these locations. We also visited the Altus Corporation in San Jose, California, observed their facilities, and held discussions with Altus officials. We reviewed the Air Force's specifications and test reports on Altus' qualification of its battery, but we did not independently validate these technical reports.

We performed our review in accordance with generally accepted government auditing standards between February and April 1987.

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We discussed the results of our review with responsible officials at the Ballistic Missile Office, and their views were considered in preparing this report. At your request, we did not obtain official DOD or contractor comments.

Copies of this report are being sent to the Secretary of Defense and the Secretary of the Air Force. Copies will also be made available to other interested parties upon request. If you have any questions, please call me on (202) 275-4268.

Sincerely yours,



Harry R. Finley
Senior Associate Director

LOCATION AND COMPONENTS OF THE LITHIUM BATTERY

Figure I.1: Launch Facility Power Systems

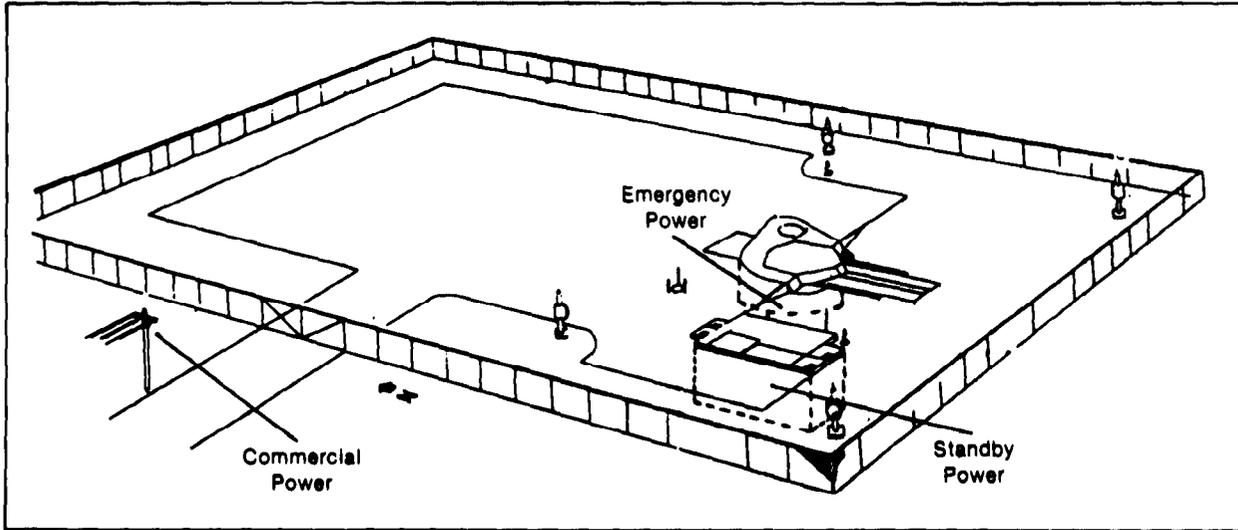


Figure I.2: Emergency Power

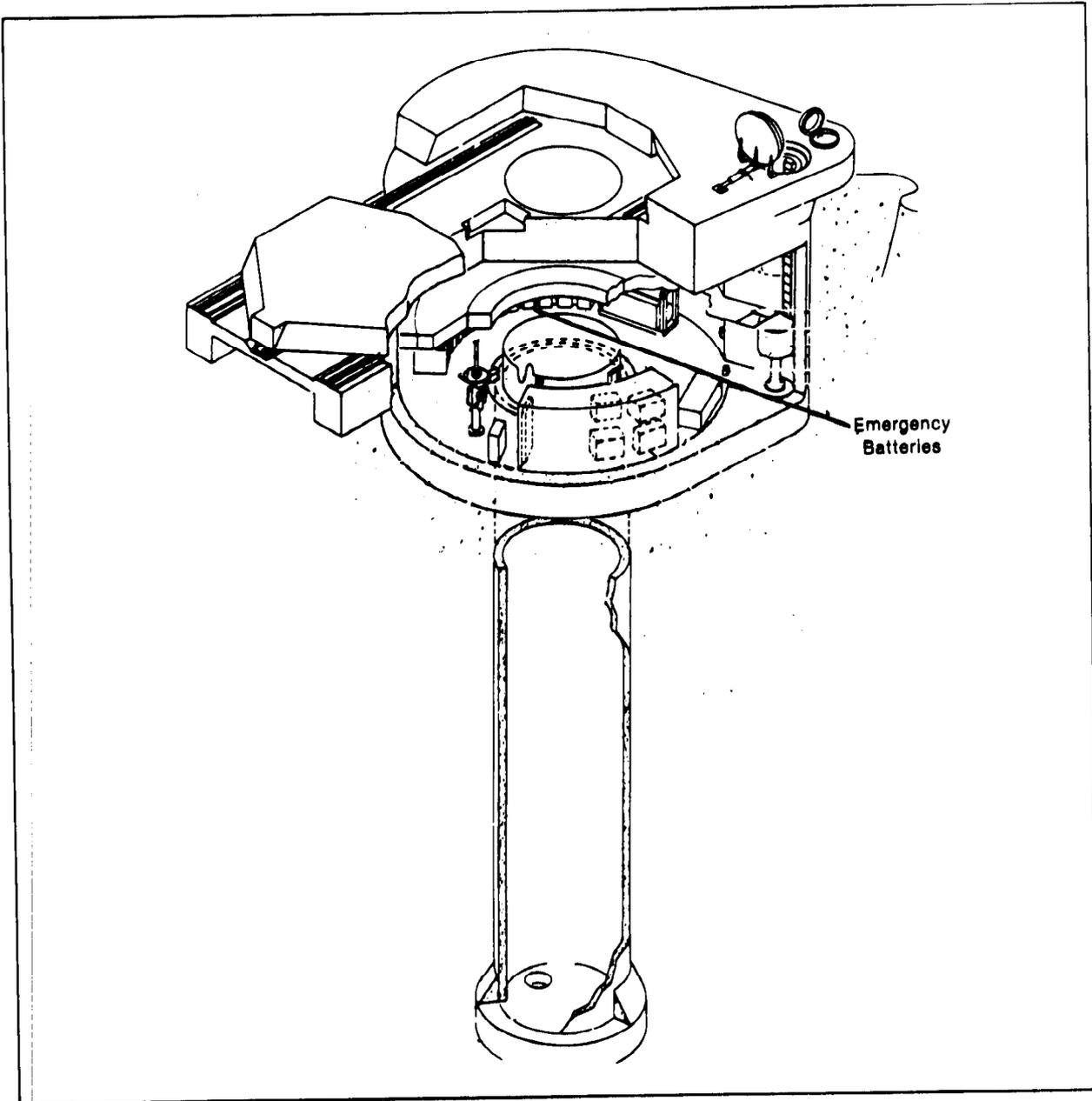


Figure I.3: Emergency Battery Configuration

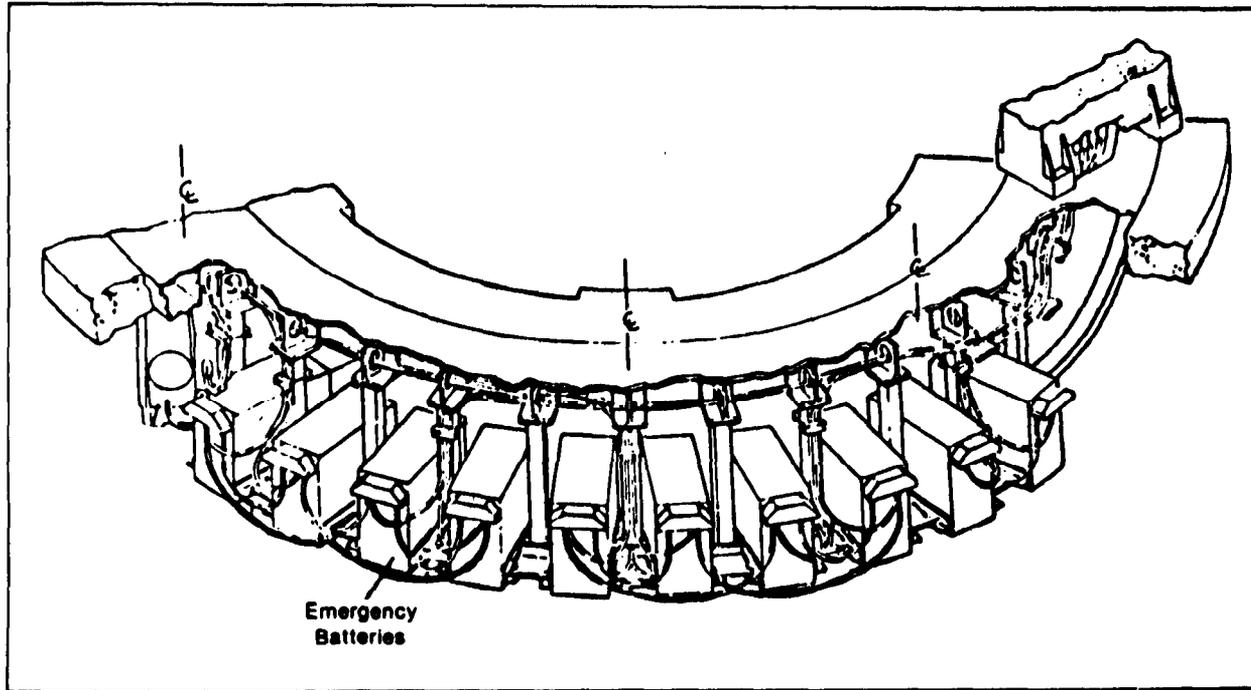
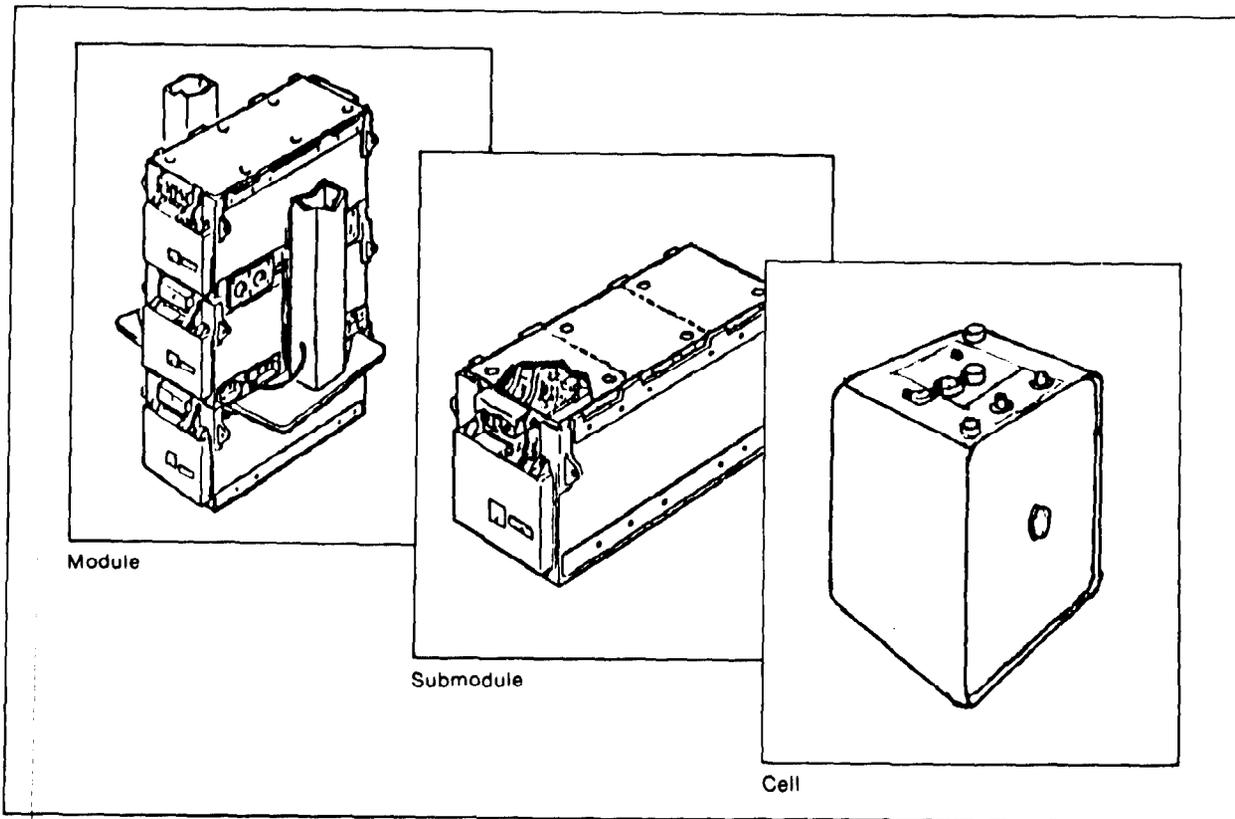


Figure I.4: Lithium Battery Components



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