JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION (JOFOC)

(In accordance with Federal Acquisition Regulation (FAR) 6.3 – Other than Full and Open Competition)

FERMI GAMMA-RAY SPACE TELESCOPE PRIME MISSION OPERATIONS AND GROUND SYSTEMS ENGINEERING
April 30, 2010

1. **This document is a justification for other than full and open competition prepared by NASA's Goddard Space Flight Center (NASA's GSFC):**

   NASA's GSFC requests authorization to procure a follow-on contract for the Fermi Gamma-ray Space Telescope (FGST) mission operations and ground systems engineering with the incumbent, Goldbelt Orca, in order to maintain the health and safety of the observatory through the remaining portion of the prime mission phase.

2. **The nature and/or description of the action being approved:**

   NASA's Goddard Space Flight Center proposes to enter into a contract with Goldbelt Orca for three years for continued prime mission operations and ground systems engineering support for FGST. The period of performance is expected to begin on August 1, 2010 upon expiration of the current FGST mission operations and ground systems engineering contract (NNG04EF68C). The proposed contract will obtain support to operate the FGST satellite to meet mission objectives, to operate and maintain the ground system elements in the Mission Operations Center (MOC), to provide sustaining engineering for the ground system, and to provide systems engineering to manage overarching spacecraft and ground system interdependencies. The resultant contract will be a cost plus fixed fee contract.

   FGST addresses major questions in astronomy, cosmology and physics, such as the early history of star formation, the origin of black hole particle jets, the nature of dark matter, and the source of gamma-ray bursts (GRBs), the most powerful explosions in the Universe. FGST, launched in June 2008, has already made significant discoveries and has provided NASA and the scientific community with significant data that has resulted in many published scientific papers. If properly maintained and operated, FGST should continue to provide the science community with data for years to come. Consistency and stability of those providing mission operations and ground systems engineering ensures observatory health and safety and continued FGST scientific productivity.

3. **Description of the supplies or services required, including an estimated value:**

   The key component of this follow-on contract is the operation and maintenance of the spacecraft for the remaining three years of its primary mission phase, consistent with its development, integration and test, and the initial two-years of operations, in order to maximize the likelihood for full mission success.

   The contractor's Flight Operations Team (FOT) will support mission operations by performing the day-to-day science planning; generating and up-linking of command loads; down-linking, monitoring, and transferring housekeeping data as appropriate; and capturing, processing, and transferring science and ancillary data as appropriate. This also includes the

detection of spacecraft, instrument, and ground system anomalies; responding to anomalies by following approved procedures for known problems and investigating the root cause of new anomalies and developing corrective actions. All anomalies will be documented and tracked and all corrective processes will be kept under configuration control. Additionally, the FOT will monitor housekeeping and health and safety telemetry over time to detect trends in the performance of the spacecraft and its components. The team will work with spacecraft and instrument personnel to identify, test, and implement appropriate responses to issues identified from the analysis of system and subsystem trend data.

The contractor's sustaining engineering team will provide hardware and software maintenance and system administration for all mission operations and data processing systems located at the MOC. This includes ensuring compliance with all GSFC IT security requirements and updating operating systems and network security software for all systems accordingly.

[section deleted]

4. Statutory authority permitting other than full and open competition:

The statutory authority permitting other-than-full-and-open competition is 10 U.S.C. 2304(c)(1), as implemented by FAR 6.302-1 - Only One Responsible Source.

5. A demonstration that the proposed Contractor's unique qualifications or the nature of the acquisition requires use of the authority cited:

The body of knowledge and experience accumulated by the Goldbelt Orca team during MOC development, spacecraft integration and test, launch support, and 2 years of on-orbit operations make it the only responsible source capable of immediately meeting the technical requirements of the prime mission phase.

The Goldbelt Orca team received in-depth training from the spacecraft and instrument vendor teams responsible for building and integrating the spacecraft and instruments. They worked side-by-side during spacecraft and instrument testing, learning how the systems worked both nominally and anomalously. They supported a series of pre-launch ground system readiness tests as well as many mission readiness tests that included the spacecraft and instruments. They worked closely with the spacecraft and instrument teams during the spacecraft and instrument activation and commissioning phases immediately following launch. There would be a significant learning curve for a new contractor to gain the knowledge that the Goldbelt Orca team has. This would increase the risk that problems would not be detected or responded to in a timely fashion resulting in possible loss of science data or possible damage or loss of key functions of the spacecraft or the instruments.

An FOT must interface with many individuals and organizations as part of their day-to-day mission operations support. The Goldbelt Orca team has long-standing and respected relationships with the operations teams at the ground stations and the Science Operations Centers (SOCs) that support the daily transfer and archiving of housekeeping and science data and with members of the science community with whom they communicate regularly

about health and safety trend data. Their expertise with this mission and its instruments, enable them to fully understand the instrument operations and science needs and are therefore able to detect small changes in the data and alert the science teams so that potential problems can be averted. They have been effective in detecting and communicating potential anomalies and working cooperatively with other operations teams and science community members to identify, test, and implement appropriate resolutions.

The Goldbelt Orca team was a key participant in recent Conjunction Assessment (CA) discussions. There was a real threat of a conjunction (i.e., collision) in January and April 2010 and the team was instrumental in providing and analyzing critical data, identifying possible avoidance actions, and developing the necessary procedures. Although no action was required, invaluable knowledge was gained by the team.

The Goldbelt Orca team has provided operations support and technical analysis associated with anomalous spacecraft performance and has developed specialized expertise. The team continues to analyze and track reaction wheel risk parameters, which can impact slew performance and the flight battery performance, which if mismanaged would jeopardize mission success.

The subsystem and operations learning curve is steep, resource intensive, and time consuming. Recreating the knowledge and experience base currently available under the existing contract could only be accomplished through considerable and unnecessary duplication of expenses already incurred by NASA and would introduce unnecessary risk to the current high level of science productivity. Therefore, a contractor change at this point in the program is not beneficial from a technical or management perspective.

6. **Description of the efforts made to ensure that offers are solicited from as many potential sources as practicable, including whether a notice was or will be publicized as required by Federal Acquisition Regulation (FAR) 5.202:**

Based on the required expertise and program constraints described above, efforts to solicit more than one source for this procurement were not considered as a viable alternative. The procurement will be synopsized on the NASA Acquisition Internet Service (NAIS) to ensure that any other potential contractors have the opportunity to express their interest in proposing to meet the requirements.

7. **A determination by the contracting officer that the anticipated cost to the Government will be fair and reasonable:**

A cost analysis will be performed as described in FAR 15.4. Goldbelt Orca will be required to submit a proposal that will be evaluated and negotiated by the Government. The Contracting Officer will utilize all sources such as the Defense Contract Audit Agency (DCAA) and Government technical and financial representatives in determining a fair and reasonable cost. In addition, historical data established under the existing Goldbelt Orca contract will be used for cost comparisons, as applicable. After work is authorized, the Contracting Officer's Technical Representative (COTR) will monitor Goldbelt Orca's performance through technical reviews and reports.

8. Description of the market research conducted, and the results, or a statement of the reasons market research was not conducted:

No formal market survey was conducted for the proposed acquisition. The FGST Project is fully aware of the aerospace industry's experience and capabilities with regard to scientific satellite operations.

The Goldbelt Orca team developed the ground system, performed integration and test with the spacecraft, executed the launch and early orbit portion of the mission, and has supported the first two years of the 5-year Prime mission phase. The Goldbelt Orca team has an exhaustive number of hours of training, including hands on, side-by-side training with the spacecraft and instrument vendors and members of the instrument science teams. This team supported activation and commissioning of the spacecraft and its instruments. They are familiar with the idiosyncrasies of the spacecraft and its instruments that have been seen during the first 2 years of operation and working with members of the science teams, they understand what degree of response is necessary, sufficient, and appropriate.

While there may be other sources able to perform mission operations (e.g., MOMS) the Fermi prime mission subsystem and operations learning curve is steep, resource intensive and time consuming. Recreating the knowledge and experience base currently available under the existing contract could only be accomplished through considerable and unnecessary duplication of expenses already incurred by NASA and increased risk to achieve prime mission requirements. The existing Training Certification Plan requires that all FOT members be certified at both the Command Controller and the Spacecraft Analyst levels. The contractor would need to demonstrate attaining knowledge of spacecraft specific information, and performance of specific processes. It is expected that a minimum of 6 months, including extensive on the job training with a qualified trainer, is required to obtain that knowledge. To train an entire team would increase the costs by more than 3 staff years, and would adversely impact ongoing operational efficiency and introduce unnecessary mission risk. Realistically, the breadth and depth of knowledge gained by the Goldbelt Orca team from working with the spacecraft bus and science instrument developers and the experience gained from operating the spacecraft for 2 years simply cannot be replaced with a standard training module. Therefore, a contractor change at this point in the program is not beneficial from a technical or management perspective.

9. Other facts supporting the use of other than full and open competition:

The incumbent contractor has provided the project with excellent support to date and the working relationship between the proposed contractor, the project, and all interfacing elements is good. It is important to maintain the current level of support during the remaining three years of the prime mission phase. The budget for the prime phase is capped. Any transition to a new service provider would result in an increase in costs. Moreover, further cost reductions are anticipated for the extended mission phase. The Government will rely heavily on the expertise and experience of the incumbent team to make changes to the operations concept and procedures to ensure continued mission success at lower operations costs without incurring unnecessary risk. Goldbelt Orca's team has the critical skills and the knowledgeable staff required to successfully accomplish the Program's objectives, to ensure

a safe, full, and productive completion of the prime mission phase and to prepare the mission for the onset of the extended mission phase.

10. Sources, if any, that expressed an interest, in writing, in the acquisition:

A synopsis was publicized for this acquisition as required by FAR 5.202. There were no responses.

11. The actions the Agency may take to remove or overcome any barriers to competition before any subsequent acquisition for the supplies or services required:

The Goldbelt Orca team is the only known source with the capability, expertise, and familiarity with FGST to support its continued safe and efficient operation and high level of scientific productivity during the remainder of the prime mission phase. This capability is especially unique to Goldbelt Orca. For this reason, it is not currently in the best interest of the Government to compete the above-described work among other sources.

Any potential future work, such as a mission extension beyond the primary phase, will likely be incorporated in the GSFC mission operations support services contract in effect at that time. With the successful completion of prime mission requirements and having received a transition plan for extended mission support from the Goldbelt Orca team that includes changes to the operations concept and procedures that address a reduced operations cost and a compilation of all known anomalies, their detection characteristics, and the appropriate response, the Government believes the risks of transition are lower and more manageable than during the prime mission phase.