

NNG06HX04C

**SUPPORT SERVICES TO THE GLOBAL MODELING AND
ASSIMILATION OFFICE (GMAO)**

STATEMENT OF WORK

ATTACHMENT A

JANUARY 2005

**STATEMENT OF WORK for Global Modeling and Assimilation Office
Code 610.1**

I. INTRODUCTION

The purpose of this contract is to provide continued support to GSFC's Global Modeling and Assimilation Office (GMAO), a key activity within the Earth-Sun Exploration Division for the development and use of models and assimilation systems. The goals of the GMAO include the advancement of satellite data in weather and climate prediction, and the use of satellite data to advance the U.S. environmental modeling capabilities.

II. BACKGROUND

The Global Modeling and Assimilation Office at Goddard develops, operates, and maintains data assimilation systems for the atmosphere, ocean, land surface, atmospheric constituents, and ocean biology. The data assimilation systems comprise observation characterization for the assimilation context, the analysis systems which combine model and observation information, and the models required to interface with the analysis systems. The GMAO also develops the coupled models (ocean-atmosphere-land surface; atmospheric dynamics with chemistry; ocean dynamics with biology, etc) to support the assimilation systems and to address the key scientific questions and prediction goals identified by the NASA Science Mission Directorate. The GMAO collaborates with the external science community in developing and validating these systems. In particular, the GMAO participates in the Joint Center for Satellite Data Assimilation, collaborating with NOAA's National Centers for Environmental Prediction (NCEP) on developments for atmospheric data assimilation and on ocean data assimilation for initialization of seasonal forecasts. All model and assimilation systems are being developed or are being implemented using the Earth System Modeling Framework (ESMF).

The GMAO atmospheric data assimilation system (also referred to herein as the GEOS DAS) provides assimilated data products to EOS instrument teams for use in their product generation and validation, assimilates data from selected EOS instruments, and generates products in support of field campaigns. Synthesis products are also provided as a reprocessing of the historical data streams during the satellite era. These synthesis products are focused on the climate record and are provided to a variety of climate scientists. Model simulations are also generated for scientific analysis. A description of the current system, GEOS4.0.3, and a validation of its performance is available at the GMAO web site: <http://gmao.gsfc.nasa.gov/systems/geos4>. The GMAO is currently testing and tuning the fifth version of the Atmospheric DAS (GEOS5 DAS), to provide

improved products and especially a better representation of the hydrological cycle. GEOS5 includes the Gridpoint Statistical Interpolation (GSI) scheme developed at NOAA/NCEP and also includes a substantially updated atmospheric model integrated under the ESMF paradigm. GEOS5 consists of nearly one million lines of Fortran code.

In addition to the assimilation of conventional meteorological data, temperature and moisture profiles and ozone observations from satellites, and satellite-derived winds, the GMAO is advancing the assimilation of cloud and precipitation data, and optimizing the selection of data from existing sounders. The Office is also developing capabilities for assimilation of trace gases, carbon species and aerosols.

The GMAO develops modeling and assimilation systems for an experimental short-term climate prediction capability for NASA's Science Mission Directorate. The systems are used to help assess the role of satellite data as part of a global Earth observing system by investigating the optimal blend of remote and in situ observations for short-term climate prediction. The coupled atmosphere-ocean-land-ice modeling system and the component models being used by the GMAO are presented on <http://gmao.gsfc.nasa.gov/research/modeling/cgcm/index.php>. The initialization of the coupled system focuses on the initialization of the ocean and land surface components. Optimal interpolation and Ensemble Kalman Filter methods have been developed for the ocean model (see <http://gmao.gsfc.nasa.gov/research/ocean/>), the latter being key for the assimilation of satellite altimetry. Ensemble Kalman Filter methods are being tested for the assimilation of soil moisture and snow observations into the land surface model. The project targets not only the short-term climate variations associated with SST variations in the tropical Pacific, but also those processes and teleconnections that have socio-economic impacts on the continents, especially the United States.

In addition to the development of its experimental prediction system, GMAO currently conducts research in the area of sub seasonal-to-decadal variability of Earth's climate system, with specific emphasis on variability due to the El Nino-Southern Oscillation (ENSO), monsoon phenomena and the identification of mechanisms controlling long-term drought. These studies use simulations of the coupled atmosphere-ocean-land system as well as their component models for process studies, for assessment/validation of the models, and for investigations of short-term climate predictability. Such studies help identify areas in which further model development is required. Analyses of satellite and in situ observations of the ocean, atmosphere and land surface characteristics are also undertaken. Such studies, and the experimental predictions themselves, require the assembly, quality control, and organization of various data streams.

It is expected that GMAO support will require experience in theoretical and observational oceanography, atmospheric dynamics and physics, and land surface processes, numerical analysis, ocean and atmospheric model development, estimation theory for earth science applications, statistical analyses, data format protocols, local data system software design and management, visualization software development, software engineering, and local (departmental) computer system administration.

III. GENERAL GLOBAL MODELING AND ASSIMILATION OFFICE (GMAO) OBJECTIVES/REQUIREMENTS

The GMAO is committed to advancing data assimilation and the use of satellite data for climate analyses and weather and climate prediction. The assimilation projects require a substantial commitment to product-oriented scientific research and development. The large and complex systems development effort requires commitment to sound software engineering and project management.

Each of the requirements described below has scientific advancement as its objective. The contractor support work required by most tasks involves the development or modification of major software systems and subsystems.

The contractor shall support the projects within the GMAO that encompass all aspects of the development, operation, and maintenance of the assimilation and forecast systems, specifically in three areas: Scientific Research and Development Support; Development and Maintenance of Operational Capabilities; Computer Systems Administration and Project Administration Support. The contractor shall provide all necessary resources including personnel, facilities, equipment, and materials, unless otherwise provided by the Government in order to meet the performance-based requirements. The Government provides local analysis and data servers and peripherals to be shared by the GMAO team, comprising civil servants, visiting scientists and contractor staff. The high end computing resources needed to achieve the research and development efforts of the GMAO are provided through the NASA Center for Computational Sciences at Goddard and through the NASA Advanced Supercomputing (NAS) Division at NASA/Ames Research Center.

PROJECT OBJECTIVES:

- a. Development and use of atmosphere, ocean and land surface data assimilation systems to enhance the utility of satellite data in environmental modeling, analysis and prediction
- b. Development and use of atmospheric constituent modeling and assimilation
- c. Development and use of coupled climate models and coupled chemistry-climate models
- d. Development and use of ocean biology and carbon cycle models and assimilation systems
- e. Development and use of subseasonal-to-decadal climate forecast system to support research into predictability and to enhance forecast skill by optimizing the use of satellite data
- f. Scientific analysis of model simulations, data assimilation products, and both satellite and in situ data,

- g. Visualization of satellite data, model simulations, and data assimilation products.
- h. Generation of products on an operational basis to support NASA instrument teams, other customers and GMAO research.

Specific tasks are expected to include those described below.

IV. Scientific Research and Development Support Objectives/Requirements

A. SPECIFIC OBJECTIVES OF THE PROJECT:

The GMAO project is expected to achieve and the contractor shall support the following objectives:

1. Develop advanced methods for assimilating satellite observations, focused on
 - a. atmosphere (meteorology): hyperspectral and limb sounders, data in cloudy or raining regions, precipitation, total precipitable water, latent heating profiles, and cloud properties;
 - b. atmosphere (constituents): ozone, carbon species and aerosols;
 - c. ocean: altimetry, surface salinity, and ocean color;
 - d. land surface: surface temperature, soil moisture and snow.
2. Develop assimilation methods to accommodate biases in the observations and the models.
3. Conduct research towards defining an optimal observing system.
4. Develop adjoint-based tools to evaluate data impact on weather prediction in the context of the entire observing system.
5. Develop comprehensive diagnostic, monitoring and evaluation tools for the GMAO models and analysis systems for a variety of the following applications: (1) numerical weather prediction, (2) climate analysis and prediction, (3) observing system evaluation and design of new missions, (4) input to instrument team algorithms, (5) air quality prediction, and (6) other research applications that emerge from NASA research announcements. Assemble observations and other model simulations or analyses to aid in the evaluation.
6. Use cloud and precipitation observations from space-borne sensors and information from cloud resolving models to improve physical parameterizations in the GMAO global AGCM.
7. Use satellite observations and diagnostics from the various applications to improve the GMAO component and coupled models.

8. Develop assimilation methods using the atmospheric forecast model as a weak constraint to ensure effective use of satellite observations of cloud and precipitation.
9. Develop effective techniques to initialize coupled climate forecasts and use satellite observations to improve forecast skill. Conduct and assess experimental climate forecasts on a regular basis.
10. Conduct research on the underlying mechanisms and predictability of climate variations at time scales from subseasonal to decadal.
11. Provide a quantitative assessment and documentation of the GMAO products, develop and document suitable diagnostics packages for validation of GMAO datasets, and prepare customized datasets for GMAO customers.
12. Evaluate the GMAO re-analysis of the historical data streams during the satellite era in the context of identifying climate trends and long-time scale variations.
13. Produce animations using state of the art visualization software and hardware, and producing web-based visualization products to disseminate GMAO results.

B. REQUIREMENTS

The following requirements shall be supported by the contractor: *(1) Atmospheric Data Assimilation System Development and Experimentation, (2) Cloud and precipitation modeling and assimilation, (3) Atmospheric constituent modeling and data assimilation, (4) Land surface data assimilation, (5) Ocean data assimilation system development and experimentation, (6) Observing system development, (7) Model Development, (8) Systems integration and validation, (9) Climate Reanalyses, (10) Experimental seasonal-to-interannual coupled climate forecasts, (11) Coupled forecast experiments on sub seasonal time scales, (12) Scientific data bases, (13) Visualization of observed and model-generated fields and publication of results, and (14) Development of an experimental environment for GMAO models and analysis tools.*

B.1 Atmospheric Data Assimilation Development and Experimentation

The contractor shall be responsible for:

B.1.1 Contributing to the atmospheric analysis development. In particular, the contractor shall be responsible for tuning the DAS and the model in DAS mode, for improving the formulation of forecast and observation error covariance models used within the GSI. The contractor shall also contribute to the development of advanced methods necessary to assimilate cloud-contaminated observations and cloud and precipitation data.

B.1.2 Development of advanced diagnostic tools for monitoring system performance as an integral part of the overall DAS development. The contractor shall be responsible for developing a comprehensive suite of diagnostic tools (e.g., to examine forecast skill and

fit to observations), as well as user-friendly programs and scripts to facilitate their broad use by GMAO investigators. The contractor shall be responsible for conducting appropriate diagnostic experiments and for diagnosing, reporting and documenting results as part of the overall development lifecycle.

B.1.3 Ensuring all developments are optimized to run efficiently on distributed memory parallel computer architectures with large numbers of processors. System computational performance will be evaluated in the context of operational numerical weather prediction throughput requirements. Analysis development will encompass the optimization on scalable systems and the implementation of ESMF.

B.1.4 Providing support for the GMAO Atmospheric Data Assimilation System (ADAS), in the retrieval, processing, and monitoring of conventional data streams, and of satellite data that are assimilated into the system.

B.1.5 Technical leadership for the GMAO in terms of utilization of new satellite and conventional data, ADAS monitoring, evaluation and validation, according to requirements specified in individual task orders. Task orders may require estimating and/or reformulating error covariance models to maximize the impact of particular data types. For high-density data, such as cloud-drift winds and hyperspectral imagers, it involves development of appropriate thinning or data/channel selection procedures.

B.1.6 Development and improvements in the capability to assimilate precipitation, total precipitable water, latent heating profiles, and cloud optical properties into the ADAS. The tasks include monitoring the data to check for biases and quality control problems, the development of appropriate error covariance models, and the conduct of experiments to evaluate the system.

B.2 Cloud and precipitation modeling and assimilation

The contractor shall support the:

B.2.1 Research and development of advanced techniques to use cloud and precipitation observations from space-borne sensors to improve physical parameterizations and global analysis products of GMAO systems.

B.2.2 Implementation, testing, and performance evaluation of cloud and precipitation assimilation schemes within the GSI analysis framework in operational GMAO global systems.

B.2.3 Development of innovative/advanced assimilation techniques (including ensemble data assimilation) to better understand the interface between model physics and analysis techniques in order to extract the maximum information from data to improve GMAO systems. The Goddard Cumulus Ensemble (GCE) model shall be used in both simulation and assimilation modes to interpret satellite measurements at pixel scales to global model

grid domains and to provide cloud-ensemble data to be used as a benchmark for evaluating cloud/precipitation parameterizations used in GMAO global systems. The satellite data shall include precipitation and latent heating information from passive microwave sensors (TMI, SSM/I, AMSR-E) and cloud information from Terra/Aqua MODIS, CloudSat, and CALIPSO.

B.3 Atmospheric constituent modeling and data assimilation

The contractor shall:

B.3.1 Perform tasks that require further development of the ozone assimilation system, particularly online assimilation within the GSI and the improvement of ozone forecast error covariances, including their Lagrangian short-term evolution.

B.3.2 Monitor ozone products from a variety of platforms, including MIPAS, AIRS and POAM data and data from Aura sensors (OMI, MLS). These data will be assimilated to generate gridded ozone products and ozone forecasts.

B.3.3 Evaluate the quality of ozone fields by comparisons with independent ozone data, monitor the operational ozone products and assist users of the products as needed.

B.3.4 Provide a variety of other stratospheric and tropospheric trace gases that shall be assimilated in addition to ozone, particularly carbon species from AIRS.

B.3.5 Contribute to the implementation of the GMAO Global Aerosol Assimilation System (GAAS), with emphasis on SAGE and MODIS aerosol measurements.

B.3.6 Provide support on the acquisition and reformatting of input data sets, running of experiments and analysis of results.

B.3.7 Contribute to the study of the meteorological structure and transport properties of GMAO's analysis products. Emphasis shall be on the quantitative study of the three-dimensional structure of the middle atmosphere and the tropopause region, focusing on the tropical quasi-biennial oscillation, the structure of polar vortices and the surf zone, and stratosphere-troposphere exchange.

B.3.8 Provide a quantitative assessment and documentation of the GMAO products in the middle atmosphere, develop and document suitable diagnostics packages for validation of GMAO datasets, and prepare customized datasets for GMAO customers.

This requirement will also focus on the implementation and testing of chemistry codes into the GMAO AGCM. Model simulations will be conducted to investigate relationships between the atmospheric composition and the circulation. A range of model simulations will be performed to investigate links between climate change over the past 50 years and the stratospheric ozone distribution.

B.4 Land surface data assimilation

The contractor will be responsible for:

B.4.1 Integrating, testing and evaluating land assimilation methods to make use of remotely-sensed observations of surface temperature, soil moisture, and snow (including MODIS land products) to analyze and predict land surface conditions and their impact on atmospheric circulation at a variety of time scales. The requirement includes the integration and evaluation of all algorithms, data assembly and preparation, model simulation, assimilation and prediction. The GEOS5 DAS uses the GMAO catchment-based model. The Ensemble Kalman Filter has been developed for the catchment model to assimilate soil moisture data. It is being extended to incorporate land surface skin temperature and snow observations.

B.4.2 Supporting this effort by conducting tests of the system, validating the system by diagnosing its performance in the NWP framework and in the seasonal forecast framework and by comparison with independent observations.

B.4.3 Assembly of data sets for ingestion into the assimilation system and for validation data sets.

B.5 Ocean data assimilation system development and experimentation

The contractor will be responsible for:

B.5.1 Development and exercise of a global ocean data assimilation system. Developments shall be aimed at improvements to the existing parallel ensemble Kalman filter assimilation and optimal interpolation methods implemented with the GMAO ocean model and their utilization in the initialization of the coupled system. Tests of the system shall also be conducted with NOAA's MOM4.

B.5.2 Development that focuses on assimilation of ocean altimetry, ocean surface salinity, and ocean surface color data. In situ data must include Argo. The efficacy of the developments will be evaluated by cross-validation and by the impact on short-term climate forecast skill.

B.5.3 Developments optimized in terms of the computational performance of the implementation on a parallel computer architecture to ensure the shortest time to solution possible. All developments must also be compliant with the Earth System Modeling Framework (ESMF).

B.5.4 The contractor shall have the responsibility of retrieving these data sets, including real-time retrievals for forecast initialization, preparing them for ingest into the assimilation system (including quality control if needed), and utilizing them for comparisons with the assimilation analyses and with the coupled forecasts.

B.6 Observing system development

The contractor shall:

B.6.1 Conduct data sensitivity and data withholding experiments to evaluate and ensure maximum data impact. The requirement includes the development of adjoint-based tools for the atmospheric DAS to evaluate data impact in the context of the entire observing system.

B.6.2 Provide assistance with developing, in collaboration with other GSFC and NOAA/NCEP scientists, an Observing System Simulation Experimentation infrastructure to evaluate the impact of proposed new observations and to help in planning new missions. The impact of new observations may be evaluated for environmental analyses, weather and climate prediction, and climate monitoring. The observing system tools will be extended beyond meteorological analyses to those for constituents, ocean, and land surface.

B.6.3 Quantifying the impact of various oceanic data streams on seasonal forecasts: sea surface height from altimeters, AVHRR, subsurface temperature profiles from tropical Pacific moorings (TAO), subsurface salinity profiles where available from Argo, subsurface temperature from XBT data, data from drifting sensors, satellite-based surface winds, precipitation, surface salinity through Observing System Simulation Experiments (OSSEs).

B.6.4 Quantifying the impact of soil moisture and snow observations on seasonal forecasts.

B7 Model Development

The contractor shall provide support for:

B.7.1 Development of individual model components and the integration of separate modules for the atmosphere and land surface into a unified GMAO Atmospheric General Circulation Model (AGCM) and a unified GMAO Land Surface Model (LSM). Atmospheric model development will focus especially on the improvement of moist physics parameterization in high resolution simulations, the improvement of gravity wave drag parameterizations, and the coupling with atmospheric chemistry modules for the troposphere and stratosphere. Support shall include optimization of code performance, ESMF-compliance, simulations conducted for model/module evaluation and validation and for scientific analyses. Support for developments by collaboration with scientists external to the GMAO will be provided as specified in individual task orders.

B.7.2 Integration, tuning and evaluation of coupled models: coupled climate model (atmosphere-ocean-land-sea-ice) system; coupled chemistry-climate system; coupled ocean biology and carbon system.

B.7.3 Conducting model evaluations through comparisons of output with observations. The contractor shall assemble the data sets for model validation. Particular process experiments with prescribed forcing, experiments with models of varying resolution, and the like, will be conducted. Experiments will be aimed at identifying rectifiable deficiencies in the models.

B.7.3 Interfacing with the GMAO Assimilation groups, in providing the models to be included in the analysis system and for providing feedback to the model developers on model performance issues that arise through assimilation.

B.7.4 Component model development and assessment will take place in a parallel computing environment through the conduct of a series of model experiments designed in collaboration with GMAO civil service staff. Model development will encompass the optimization of all components on scalable systems and the implementation of ESMF.

B.8 Systems integration and validation

The contractor will be responsible for:

B.8.1 Integration of assimilation and model elements developed by GMAO scientists and collaborators within the data assimilation system. The integration will encompass both algorithmic integration and optimization, and scientific integration to ensure scientific integrity and validity to support further scientific exploration. Scientific integration includes validation.

B.8.2 Development of comprehensive diagnostics packages for each component and coupled system, including assembly of observations and other model simulations to aid in the validation. Validation encompasses a broad range of applications – particular science applications, climate and weather prediction, instrument team applications, etc.

B.8.3 Providing online documentation of the systems and for ensuring that the GMAO software complies with GMAO documentation standards.

B.9 Climate Reanalyses

B.9.1 The contractor shall aid the development and testing of the ADAS in the context of generating a research-quality analysis of the historical observation suite in a manner that supports analyses of the climate system. Tasks include data preparation, development of a local repository of validation data sets, and evaluating discontinuities in the analyses associated with changes in the observing system, particularly the satellite observing system. The climate-oriented product will be analyzed particularly for changes in the water and energy balances.

B.9.2 The climate analyses will also be generated for ocean and land surface states.

B.10 Experimental seasonal-to-interannual coupled climate forecast

The contractor shall:

B.10.1 Use GMAO ocean data assimilation software, land data assimilation software and coupled initialization system to conduct and assess experimental forecasts for up to 2 years' duration. Experiments shall be conducted in near real-time, others in retrospective mode. Forecast uncertainty shall be characterized through the use of ensembles.

B.10.2 Provide assistance in the design of the ensemble strategy to most appropriately represent forecast uncertainty.

B.10.3 Contribute to evaluation of the system. The contractor shall be responsible for regular diagnostics of forecast accuracy which will be assessed both by the amplitude and phase of the commonly used SST indices and by the patterns of SST, ocean heat content, and thermocline depth anomalies, surface wind stress anomalies over the tropical Pacific and the surface temperature and precipitation patterns over the continental U.S.

B.10.4 Assemble the suite of validation data, document the suite of experiments, and set up near online access to the experimental forecast output.

B.10.5 Support testing and tuning of any updated versions of the CGCM. The contractor shall conduct century-long simulations with the CGCM, undertake diagnostics of such simulations to quantify the model's inherent variability and compare with observations to quantify the model's verisimilitude to nature in its seasonal and interannual variations.

B.11 Coupled forecast experiments on subseasonal time scales

B.11.1 The contractor shall use GMAO atmospheric data assimilation software, land data assimilation software and coupled initialization system to conduct and assess experimental forecasts for one season, with emphasis on the ability to forecast variability on subseasonal timescales, such as the Madden-Julian Oscillation, North American Monsoon, etc.. Experiments shall be conducted in near real-time, others in retrospective mode from 1982 to the present. Forecast uncertainty shall be characterized. Some experiments will be conducted with large ensembles to focus on the prediction of an evolving probability distribution and the likelihood of extreme weather events.

B.12 Scientific data bases

Scientific analyses of data and coupled ocean-atmosphere-land-surface model-generated fields as well as component model-generated fields will include the retrieval and maintenance of atmosphere, ocean, and land surface observational data bases for model forcing, and for assimilation into the GMAO forecasting system as well as validation of experimental GMAO forecasts.

B.12.1 The contractor shall be responsible for data retrieval and ingest into a system that facilitates easy data access.

B.13 Visualization of observed and model-generated fields and the publication of scientific results through the World Wide Web will be necessary on completion of experiments. The project currently uses IDL, MATLAB, and GRADS for graphics and visualization. High quality graphics are also required for presentations and for publication in the peer-reviewed literature.

B.14 Development of an experimental environment for GMAO models and analysis tools

B.14.1 The contractor shall develop, maintain and document a software suite and interface to facilitate experimentation (models, analyses, data types) by GMAO scientists and external collaborators; provide the basis for regular scientific monitoring and system evaluation, and enable scientific validation by a variety of users by providing easy access to special products. The software tools should facilitate developments by allowing scientists to easily diagnose a broad range of GMAO research experiments.

V. Development and Maintenance of Operational Capabilities

A. SPECIFIC OBJECTIVES OF THE PROJECT

1. Provide configuration management (CM) for GMAO production systems, including the GMAO/ISO 9001 documents;
2. Provide GMAO systems engineering support for operational data production, scientific research, software development and system testing and validation;
3. GMAO Operational Software Development and Maintenance;
4. Data Assimilation System (DAS) Data Production Operation.

B. REQUIREMENTS

B.1 Configuration Management for Software and Documentation

The contractor shall:

B.1.1 Provide support services in the configuration management (CM) for GMAO production systems and appropriate documents as identified by the Government. CM procedures should also be maintained for systems under development and testing, as identified by the Government.

B.1.2 Merge branches, integrate software components, and build the GEOS DAS for system verification and subsequent promotion of the system to Operations.

B.1.3 Provide support service to the government to develop, implement, and perform backup procedures to ensure the availability of the most recent GEOS DAS release.

B.1.4 Develop and deliver a Version Description Document (VDD) for each DAS version released for Operations. Information required for the VDD shall be delivered to CM as part of the software delivery.

B.1.5 Maintain and track all change documents, such as Change Requests (CRs), Discrepancy Reports (DRs), Problem Reports (PRs), and Configuration Control Board (CCB) Action Items (AIs) to reflect their status as captured in CCB meetings.

B.1.6 Recommend CM tools (for change tracking and for software version control) to the GMAO Configuration Control Board (CCB). Install, customize, and maintain the CCB-approved CM tools and design, develop, and implement GMAO-specific processes and procedures as needed. The Contractor shall provide training to GMAO members on the CM tools, as needed.

B.1.7 Provide technical support to authors of GMAO controlled documents to ensure compliance with established QMS/GMAO standards, where appropriate.

B.1.8 Manage the controlled documents on the Intranet and develop and maintain a database of information on all GMAO controlled documents.

B.1.9 Stay abreast of and report on GPG changes in GDMS that could impact GMAO activities or audit readiness. Document the improvements in the GMAO processes as directed by the government and support all ISO audits.

B.2 Systems Engineering

The purpose of this requirement is to provide GMAO systems engineering support for operational data production, scientific research, software development and system testing and validation.

The contractor shall:

B.2.1 Provide support in High End Computing (HEC) resource planning and management of the use of these resources, including user account management.

B.2.2 Provide monthly HEC resource utilization estimates consisting of aggregate and per machine CPU utilization, project CPU utilization, volume of network traffic to/from mass storage, total storage and growth/deletion over the month, and queue wait times as appropriate.

B.2.3 Provide support to the overall system performance: software optimization and portability, memory utilization, I/O throughput, mass storage requirements for future releases of GMAO production systems.

B.2.4 Coordinate the management and organization of data products generated by or used in the operational systems in support of the GMAO data production operations.

B.2.5 Prepare a benchmark package consisting of the GMAO software systems, sample input observations and boundary conditions, target files, sample scripts, guidelines, and a list of metrics. This package will be released to the NCCS and external organizations for evaluation on alternative platforms at the request of the GMAO science staff.

B.2.6 The major external element for the GMAO data production operation is the EOS Core System (ECS), which is responsible for providing the GMAO with most of the input data sets for the GEOS product generation. The ECS is also responsible for archiving all of the GEOS standard data products and for distributing those products to the users. The contractor shall work with ECS to coordinate changes to the interface requirements for GMAO operational data products and ECS polling and ingest. The contractor shall work with ECS to test and evaluate ECS/DAAC upgrades.

B.3 GMAO Operational Software Development and Maintenance

The purpose of this requirement is to produce operational DAS software for delivery of GEOS data assimilation and forecast products in support of NASA Earth Science instrument teams and missions.

The contractor shall be responsible for:

B.3.1 Developing the operational GEOS software (SW), the GEOS system test plans, test procedures and test reports for GEOS system verification, GEOS system validation, and GEOS system operational end-to-end testing.

B.3.2 Development and maintenance of software components required to integrate upgrades to the GEOS system into the operational environment. The typical codes to be developed are input data preprocessing, I/O routines including output data formatting (such as EOS-HDF) for external customers, job scheduling scripts, and data management scripts.

B.3.3 Supporting multi-year reanalyses or reprocessing assimilations using the GEOS operational system. This support shall include identifying and preparing observations and boundary conditions and identifying their location for acquisition. The contractor shall work to clarify output streams, archival, and pickup/push for ECS.

B.3.4 Providing job control/script, including user-friendly utilities for setting up the experiments and making post-processing more flexible.

B.3.5 Providing support to scientific software developers on synchronizing with new releases of GEOS system.

B.3.6 Providing general support to GEOS data users, external or internal, in answering questions or solving technical problems related to the use of GEOS data.

B.3.7 Maintaining software development within the CVS software repository. The contractor shall document all the system changes in requisite CM records. The contractor shall be responsible for developing, maintaining and updating the file specification document that describes the format, frequency and fields in each of the data products.

B.3.8 Supporting ECS and NASA instrument teams testing by providing sample operational datasets and will provide support to ECS on the definition and implementation of modifications to the GMAO/ECS interface.

B. 3.9 Supporting operational data production by serving in an on-call capacity.

B.3.10 Providing support for planning the test of new releases of GEOS systems for their operational readiness. The planning shall include the definition of test datasets. The contractor shall perform the end-to-end system tests and document the test results in discrepancy reports (DR) and test reports if necessary.

B.4 Data Assimilation System (DAS) Data Production Operation

The GEOS DAS is currently in operation to produce atmospheric assimilated data products and forecast products in near real-time in support of EOS instrument teams and various field campaign missions. The operation of the current system is largely automated.

The contractor shall:

B.4.1 Perform the near real-time DAS data production operation of the GEOS DAS. Log and report all the anomalies encountered during the system operation monitoring. The system operation encompasses the production of First-Look, Late-Look and forecast data products as well as GEOS DAS data reprocessing and multi-year re-analyses.

B.4.2 Update the GEOS DAS operations information daily on the GMAO web page to reflect the up-to-date status of the system. The Contractor shall update the operations procedure document as needed to incorporate procedural changes due to evolving GEOS system or computing environment changes.

B.4.3 Locate, archive, prepare and provide GMAO data products and other ancillary data, e.g. data used for product verification or validation, to the GMAO data product users and developers whose data requests have been approved by the GMAO management.

B.4.4 Log all the incoming data requests by the GMAO data users. For each approved data request, the contractor shall provide an estimate of required disk space, archival space, time period for maintaining the data, preferred route for delivering data to customers. The contractor shall prepare, format and package the requested data and make them accessible to the requester within the delivery schedule agreed with the requester.

B.4.5 Obtain, catalog and maintain ancillary data identified by the Government to be used for science research, SW development, or product verification within the GMAO.

VI. Computer Systems and Project Management Support

A. SPECIFIC OBJECTIVES OF THE PROJECT

- a. Provide computer system and user administration support for GMAO staff;
- b. Provide project administration support to the GMAO;
- c. Collaborate with GMAO science staff to develop informative web pages summarizing the GMAO science investigations and exciting results.

B. REQUIREMENTS:

B.1 Computer Systems Management

The purpose of this requirement is to provide computer system and user administration support for GMAO staff.

The contractor shall:

B.1.1 Support local hardware and software maintenance activities. Hardware maintenance shall consist of the following: installation, basic repairs, coordination of vendor supplied maintenance. Software maintenance shall consist of the following: operating system upgrades, installation of 3rd party public domain and proprietary software.

B.1.2 Work proactively to address security issues and ensure a secure computing environment. The contractor shall monitor local systems for security breaches and follow defined procedures for reporting such breaches. Where there are known system vulnerabilities and violations, the contractor shall upgrade or patch the system. On a periodic basis, it will be necessary to review security procedures and update them.

B.1.3 Provide user support M-F, excluding all federal holidays. User inquiries shall be maintained in a database or log and the contractor shall respond to inquiries in a timely

manner. The resolution to problems and/or plan to resolve problems shall be maintained in the same database or log. Metrics on user inquiries shall be collected and reported on a monthly basis. If necessary, inquiries/problems shall be categorized based on priority and handled accordingly. The contractor shall present new and relevant information to the user community through web pages, email and User Forum meetings.

B.1.4 Continuously improve account creation and deletion procedures. The contractor shall insure that all foreign national paperwork is submitted when necessary. Provide an automated mechanism for checking for idle accounts. The contractor shall then ensure that accounts that have been approved for deletion are deleted in a timely fashion.

B.1.5 Provide general system monitoring, backup support and networking support. The contractor shall monitor systems for disk use, network traffic and cpu usage. Define a process for performing system backups on a regular basis. The contractor shall provide networking support for activities such as requesting/deleting IP addresses, investigating network outages and problems.

B.1.6 Provide support for the hardware procurement activity by researching available solutions and obtaining vendor quotes.

B.1.7 Provide support in property tracking activity with updates to tools and procedures. The contractor system administration staff shall support the GMAO property custodian on a periodic basis to ensure proper accountability of users with respect to computer hardware.

B.1.8 Support the use of high-end computing environment located at GSFC and at ARC.

B.2 Project Administration Support

This requirement is to provide project support to the GMAO. Support includes the maintenance of GMAO documentation and the organization of meetings with the science teams, advisory group and other collaborators.

The contractor shall:

B.2.1 Provide support in resource planning, in maintaining and tracking GMAO budgets using Goddard on-line systems, and in maintaining the GMAO projected and actual budgets, in preparing RTOP summaries and plans, and in submitting necessary paperwork for Interagency Agreements.

B.2.2 Provide GMAO procurement support to include: generating and tracking orders, and communication with vendors, customers, and local systems staff.

B.2.3 Support the GMAO as property custodian. Coordinate with GMAO system administrators and with resource tracking personnel to track property location and user

and update the NASA equipment management system database as appropriate. Prepare required shipping documentation to support equipment relocation for GFE and for equipment that is sent to a vendor for maintenance or replacement. Prepare required documentation for equipment loans.

B.2.4 Provide support in editing and distribution of GMAO newsletters and annual reports, GMAO conference and meeting support and assuring accuracy and completeness of publication and proposal databases.

B.2.5 Provide support to the GMAO in maintaining files and office records; maintaining office supplies; producing and distributing deliverable reports; coordinating meetings, seminars, and travel for civil service and technical staff; communicating general information to technical staff; ensuring that web-based information on GMAO organizational issues and structures are current.

C.3 GMAO Web Site Management

The Contractor shall:

C.3.1 Provide technical support to maintain the GMAO home page and the GMAO internal Web page known as the GMAO Intranet.

C.3.2 Maintain the GMAO Web policy and standards in accordance with NASA/GSFC Web policy and standards. Provide technical assistance to GMAO Web authors to ensure appropriate changes in format, organization, and content are made to comply with the GMAO-approved Web policy and standards. Develop Web templates to maintain consistency and support standardization.

C.3.3 Provide web development support to initiate new pages for GMAO members, as requested. The contractor shall assess the relevancy of Web material periodically and coordinate with GMAO Web authors to update obsolete information and to add/delete information.

C.3.4 Work with GMAO science staff to develop informative web pages summarizing the GMAO science investigations and exciting results.

C.3.5 Keep abreast of the latest Web technology and make recommendations to improve the performance and usability of the GMAO Web and Intranet pages, as needed.

C.3.6 Maintain online databases and information services, particularly:

- The DAS On-Line Monitoring System (DOLMS)
- Internet-based access to select GMAO datasets
- On-line databases of GMAO documents and publications
- On-line databases of GMAO products
- On-line database of Government-owned equipment

- On-line description of internal GMAO procedures
- On-line documentation of software and of system performance.

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ATTACHMENT B**

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FINANCIAL MANAGEMENT REPORTING REQUIREMENTS

ATTACHMENT B

FEBRUARY 2005

FINANCIAL MANAGEMENT REPORTING REQUIREMENTS

General

Financial Management Reports shall be submitted by the Contractor on the NASA 533 series reports, in accordance with the instructions on the reverse of the forms, NASA Procedures and Guidelines NPR 9501.2D entitled, "NASA Contractor Financial Management Reporting," effective date May 23, 2001, and additional instructions issued by the Contracting Officer.

a. Level of Detail

The Contractor's 533 reports shall contain a summary of total contract costs, as well as a separate 533 sheet for each Task Order. The reports shall contain a breakdown of each area by element of cost, i.e. direct labor hours/dollars (by category), overhead, general & administrative (G&A), travel, equipment, material, training and other direct costs.

b. Distribution

The Contractor shall distribute 533 reports to each addressee indicated in the Basic Contract Clause G.1 FINANCIAL MANAGEMENT REPORTING. These reports shall be distributed no later than the fifteenth (15) calendar day following the month being reported.

c. Reporting Requirements

Each report shall provide cost data for reporting categories presented below:

Direct Labor Hours

Onsite

(List applicable labor categories)

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Offsite
(List applicable labor categories)

Direct Labor Dollars

Onsite
(List according to applicable labor categories)

Offsite
(List according to applicable labor categories)

Total Direct Labor Hours On-site
Total Direct Labor Hours Off-site
Total Prime's Hours
Subcontractor Hours
Total Labor Hours

Total Direct Labor Onsite
Total Direct Labor Offsite

Total Onsite Overhead
Total Offsite Overhead
Total Overhead Prime

Other Direct Costs
Material
Subcontractors
Travel
Training
Miscellaneous
Total ODC's

Subtotal (Direct Cost plus Overhead)

G&A Expense

Total Cost

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Award Fee

Total Cost Plus Award Fee (CPAF)

The 533 for each task order shall report direct labor hours by category.

d. Other Special Reports

The Contractor shall submit, as required, special cost or manpower reports either in the areas of actuals, projections or both. These reports may take the form of labor, overhead, other direct charges, billing analyses or other business information. When required, specific instructions will be provided by the Contracting Officer.

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**SHARED INSTALLATION-ACCOUNTABLE
GOVERNMENT PROPERTY**

ATTACHMENT C

DECEMBER 2004

ECN Description	Manufacturer	Model Number	Purchase Price
1415212 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C2039A	\$1,809.00
1700298 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C3142A	\$2,619.00
1824443 PRINTER, ADP	TEKTRONIX INC	350	\$4,302.00
1948359 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C4087A	\$3,059.00
1955623 PRINTER, ADP, LASER	TEKTRONIX INC	Z360	\$3,523.00
1955739 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C4087A	\$3,016.00
1955740 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C4087A	\$3,016.00
1956767 PLOTTER, GRAPHICS	HEWLETT-PACKARD CO	C4704A	\$8,700.00
2042177 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C4171A	\$770.00
2112933 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C7044A	\$389.00
2114465 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C7086A	\$2,300.00
3011062 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C7063A	\$1,028.00
3011127 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C9661A	\$2,360.00
3013462 PRINTER, ADP, LASER	TEKTRONIX INC	Z750P	\$2,175.00
3015192 PRINTER, ADP	XEROX CORP	82001DP	\$2,023.00
3015193 PRINTER, ADP	XEROX CORP	82001DP	\$2,023.00
3015688 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C4267A	\$2,819.00
3034848 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C9151A	\$857.00
3067035 PRINTER, ADP, LASER	HEWLETT-PACKARD CO	C4267A	\$2,778.00
1188668 DISK DRIVE UNIT	R-SQUARED	MZRF002	\$3,073.00
1637660 COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	PP01X	\$2,074.00
1645466 COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	WCP	\$3,046.00
1738927 DISK DRIVE UNIT	R-SQUARED	MZRF001	\$1,860.00
1811025 COMPUTER, MICRO	APPLE COMPUTER INC	M2785	\$4,461.00
1812253 DISPLAY UNIT	NETWORK COMPUTING DEVICES INC	NC2195AA	\$500.00
1815079 COMPUTER, MICRO	MICRON ELECTRONICS INC	XPR-#166	\$5,497.00
1817137 DISK DRIVE UNIT	VANGARD TECHFORM R-SQUARED	NONE	\$2,295.00
1820029 DISPLAY UNIT	GATEWAY COMPANIES INC	VITTRON 1100	\$1,250.00
1942423 COMPUTER, MICRO	SILICON GRAPHICS INC	CMFN8014AWT200	\$6,232.00
1942428 DISPLAY UNIT	SILICON GRAPHICS INC	GDME0E21	\$1,440.00
1951284 DISK DRIVE UNIT	ANADATCO	NONE	\$1,115.00
1952445 DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	D1226H	\$681.00
1957850 COMPUTER, LAPTOP	DELL COMPUTER CORP F-PCS LTD	PHO	\$2,431.00
2033295 COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	MMP	\$2,399.00
2033296 DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	P990	\$513.00
2033653 DISPLAY UNIT	NEC INFORMATION SYSTEMS INC	LA2042MW	\$4,950.00
2036904 TRANSPORT, MAGNETIC TAPE	EXABYTE CORP	CH220032	\$1,692.00
2038020 DISPLAY UNIT	NEC CORP	LA1831MW	\$3,483.00
2038021 DISPLAY UNIT	NEC CORP	LA1831MW	\$3,483.00
2038235 COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	MMP	\$2,696.00
2038236 COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	MMP	\$2,696.00
2038242 DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	P991	\$513.00
2038551 COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	MMP	\$2,808.00
2038552 COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	MMP	\$2,808.00
2038554 DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	P991	\$513.00
2038556 DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	P991	\$513.00

2114467	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	P1130	\$1,100.00
2114939	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	WCP	\$1,848.00
2114940	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	WCP	\$1,848.00
2114943	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	WCP	\$1,848.00
2114944	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	P1130	\$1,000.00
2114945	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	P1130	\$1,000.00
2114946	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	P1130	\$1,000.00
2114948	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	P1130	\$1,000.00
2114952	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	WCP	\$2,100.00
2114953	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	WCP	\$2,100.00
2114954	DISPLAY UNIT	SONY CORP OF AMERICA	SDM-M81	\$1,267.00
2159408	COMPUTER, MICRO	COMPAG COMPUTER CORP	EVD03005	\$1,099.00
2159410	COMPUTER, MICRO	COMPAG COMPUTER CORP	EVD03005	\$1,099.00
2159564	DISPLAY UNIT	NEC CORP	LCD1830E	\$900.00
2165498	COMPUTER, LAPTOP	DELL COMPUTER CORP F-PCS LTD	PP08L	\$2,583.00
2561692	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	1900FP	\$951.00
2503336	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	1901FP	\$616.00
2503337	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	1901FP	\$616.00
2503329	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	1901FP	\$616.00
3010165	DISPLAY UNIT	NEC CORP	LCD1850E-BK	\$910.00
3011902	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	DHM	\$1,420.00
3011903	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	DHM	\$1,420.00
3011904	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	DHM	\$1,420.00
3011906	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	M992	\$600.00
3011907	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	M992	\$600.00
3011909	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	M992	\$600.00
3012593	DISPLAY UNIT	NEC INFORMATION SYSTEMS INC	EA-1831DMW-R	\$3,485.00
3012664	DISPLAY UNIT	NEC CORP	LA1831DMW-R	\$3,485.00
3012739	DISK DRIVE UNIT	RHINO-IR	FR100-1	\$563.00
3013465	DISPLAY UNIT	NEC INFORMATION SYSTEMS INC	LCD1850E	\$563.00
3014925	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	DHM	\$1,316.00
3014926	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	DHM	\$1,316.00
3014927	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	DHM	\$1,316.00
3014928	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	M992	\$600.00
3014929	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	M992	\$600.00
3014931	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	M992	\$600.00
3015271	COMPUTER, LAPTOP	TOSHIBA AMERICAN INFO SYSTEMS	TECRA9100	\$2,268.00
3015696	COMPUTER, MICRO	APPLE COMPUTER INC	M6498	\$1,935.00
3015697	COMPUTER, MICRO	APPLE COMPUTER INC	M6498	\$1,935.00
3034068	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	DHM	\$1,700.00
3034371	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	DHM	\$1,813.00
3034572	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	DHM	\$1,813.00
3034573	COMPUTER, MICRO	DELL COMPUTER CORP F-PCS LTD	DHM	\$1,813.00
3035039	DISPLAY UNIT	NEC INFORMATION SYSTEMS INC	NX86LCD-BK	\$515.00
3035040	DISPLAY UNIT	NEC INFORMATION SYSTEMS INC	NX86LCD-BK	\$515.00
3038634	COMPUTER, MINI	DELL COMPUTER CORP F-PCS LTD	DHM	\$2,104.00
3038641	COMPUTER, MINI	DELL COMPUTER CORP F-PCS LTD	DHM	\$2,104.00
3038644	COMPUTER, MINI	DELL COMPUTER CORP F-PCS LTD	DHM	\$2,104.00
3038648	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	1901FP	\$616.00
3038651	DISPLAY UNIT	DELL COMPUTER CORP F-PCS LTD	1901FP	\$616.00

3038654	DISPLAY UNIT	DELL COMPUTER CORP F.PCS LTD	1901FP	\$616.00
3066565	COMPUTER, MICRO	DELL COMPUTER CORP F.PCS LTD	WHM	\$1,798.00
3066579	COMPUTER, MINI	DELL COMPUTER CORP F.PCS LTD	DHM	\$1,794.00
3066580	COMPUTER, MINI	DELL COMPUTER CORP F.PCS LTD	DHM	\$1,794.00
3066581	COMPUTER, MINI	DELL COMPUTER CORP F.PCS LTD	DHM	\$1,794.00
3066582	COMPUTER, MINI	DELL COMPUTER CORP F.PCS LTD	DHM	\$1,794.00
3066583	COMPUTER, MINI	DELL COMPUTER CORP F.PCS LTD	DHM	\$1,794.00
3066584	COMPUTER, MINI	DELL COMPUTER CORP F.PCS LTD	DHM	\$1,794.00
3066590	DISPLAY UNIT	DELL COMPUTER CORP F.PCS LTD	1901FP	\$616.00
3066591	DISPLAY UNIT	DELL COMPUTER CORP F.PCS LTD	1901FP	\$616.00
3066594	DISPLAY UNIT	DELL COMPUTER CORP F.PCS LTD	1901FP	\$616.00
3066595	DISPLAY UNIT	DELL COMPUTER CORP F.PCS LTD	1901FP	\$616.00
3066596	DISPLAY UNIT	DELL COMPUTER CORP F.PCS LTD	1901FP	\$616.00

ECN Description	Manufacturer	Model Number	Purchase Price
1951184 COMPUTER, MICRO	DELL COMPUTER CORP F-PC'S LTD	XPS-D300	\$2,000.00
2041103 COMPUTER, MICRO	DELL COMPUTER CORP F-PC'S LTD	PMP	\$2,460.00
2044253 COMPUTER, MICRO	APPLE COMPUTER INC	M7572	\$3,461.00
2044843 COMPUTER, MICRO	SONY CORP OF AMERICA	PCG5322	\$2,395.00
2111331 COMPUTER, MICRO	DELL COMPUTER CORP F-PC'S LTD	PPO1S	\$3,092.00
2164762 COMPUTER, LAPTOP	PANASONIC IND CO DIV OF MATSU	CF-W2	\$2,118.00
2164761 COMPUTER, LAPTOP	PANASONIC IND CO DIV OF MATSU	CF-W2	\$2,118.00
2502332 COMPUTER, LAPTOP	DELL COMPUTER CORP F-PC'S LTD	PP04S	\$2,859.00
3015557 COMPUTER, LAPTOP	DELL COMPUTER CORP F-PC'S LTD	PP01X	\$2,210.00

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SAFETY AND HEALTH PLAN

ATTACHMENT D

SEPTEMBER 1, 2005

Note: Safety and Health Plan to be submitted with proposal, and will be incorporated in the contract after it has been reviewed and approved by the Government.

SAFETY AND HEALTH PLAN
NNG006HX04C

ATTACHMENT D.
SUBFACTOR D. SAFETY AND HEALTH PLAN



Restricted Data Notice

This plan includes data that shall not be disclosed outside the government and shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of—or in connection with—the submission of this data, the government shall have the right to duplicate, use, or disclose data to the extent provided in the resultant contract. This restriction does not limit the government's right to use information contained in these data if it is obtained from another source without restriction. The data subject to this restriction are contained in the sheets comprising the entire plan.



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FOREWORD

Science Applications International Corp. (SAIC) submits this Safety and Health Plan in response to Request for Proposal (RFP) NNG05072010R, Global Modeling and Assimilation Office Scientific Support Services, which represents policies and procedures that we have tailored to specific requirements of the Goddard Space Flight Center (GSFC). We have formatted this Plan according to requirements of NASA Procedural Requirements (NPR) 8715.3, Appendix H, and it meets NASA FAR Supplement (NFS) clause 1852.223-73. In Appendix A, we provide an initial performance evaluation profile (PEP) assessment of our Safety and Health Program, including actions we will take to achieve a score of 5 in each area, as required by NPR 8715.3.

The scope of the work requires SAIC to provide scientific support services in the areas of modeling, data assimilation, and operational product generation. The procurement encompasses research projects in development of numerical schemes suitable for earth science data assimilation, global environmental modeling, land surface and ocean data assimilation, system development observation, forecast and coupled model experiments, and the development and maintenance of operational data product generation capabilities. We anticipate completing most of the work on site at GSFC facilities using standard office equipment and furniture. However, on GSFC's approval, we may complete some tasks at remote sites (off site from Goddard) over networked resources. Additionally, we anticipate that travel to temporary duty sites may be required.

29 CFR Part 1904, Subpart B provides a partial exemption from the Occupational Safety and Health Administration's (OSHA) injury and illness record-keeping requirements for specific low-hazard industries, unless OSHA or the Bureau of Labor Statistics (BLS) informs the industry in writing that it must keep records under 1904.41 or 1904.42. The majority of SAIC's establishments are classified as exempt low-hazard industries, including classifications under Standard Industrial Classification (SIC) Code 87, Engineering, Accounting, Research, Management, and Related Services; North American Industrial Classification System (NAICS) Code 5417, Scientific Research and Development Services; SIC Code 737, Computer Programming, Data Processing, and Other Computer-Related Services; and

NAICS Code 5415, Computer Systems Design and Related Services. Therefore, our establishments are exempt from maintaining work-related injury and illness records (i.e., OSHA 300, 300A, and 301 forms) unless otherwise notified by OSHA or BLS. Each year, BLS has given notice that only select SAIC locations (generally a different number and mix of locations) must maintain work-related injury and illness records for that year. **Figure AttD-1** presents consolidated injury and illness statistics reported to BLS as part of SAIC's participation in BLS statistical surveys during the past 5 years. The incidence rates, which represent the number of injuries and illnesses per 100 full-time workers, were calculated as: $(N/EH) \times 200,000$, where N = number of injuries and illnesses; EH = total hours worked by all employees during the calendar year; and $200,000$ = base for 100 equivalent full-time workers. The lost workday rate represents the number of lost workday cases per 100 equivalent full-time workers.

Figure AttD-1 also presents our occupational injury and illness rates as compared with the average rate for the BLS work injuries and illnesses statistics for SIC 873, Research, Development, and Testing Services, and NAICS 5417, Scientific Research and Development Services for the last 5 years.

We take pride in our environmental health and safety accomplishments. **Figure AttD-2** identifies the number of health and safety violations (i.e., OSHA and related state agency actions) during the past 5 years and the current year-to-date.

At NASA GSFC, our safety record reflects that in the last 2½ years, the period for which these records are tracked, there have been no lost-time incidents on site. Our corporate safety record confirms that SAIC has had no reported injury or illness within the last 5 years related to an OSHA violation at GSFC.

The SAIC Team will use NASA's PEP to monitor the efficacy of the Safety and Health Program. After contract award, we will continually update this plan to keep it compliant with NASA and GSFC-specific requirements. We will submit quarterly safety and health reports that specify incidents, disabling injuries, lost workdays, incident rate, days lost, property damage and cost, manhours worked per month, and the total employees in accordance with the template provided at <http://safety1st.gsfc.nasa.gov/SafetyReportingTemp.doc>.



Organization	Years				
	2000	2001	2002	2003	2004
SAIC Rate—Total recordable cases ²	0.5	0.3	0.6	0.3	0.2
BLS Rate—Total recordable cases SIC 873/NAICS 5417	2.0	2.3	2.3	2.1	NA ⁴
SAIC Rate—Cases involving days away from work ³	0.2	0.1	0.2	0.1	0.05
BLS Rate—Cases involving days away from work SIC 873/NAICS 5417	0.5	0.6	0.6	0.4	NA ⁴
Total Hours Worked	15,744,000	23,419,370	16,093,125	16,981,736	19,685,004

1 Data are based on SAIC (Federal Employer Identification Number 95-3630868) locations participating in BLS-required surveys of occupational injuries and illnesses.

2 Where N = for year 2001 and earlier, the sum of OSHA 200 columns 2 (injuries with lost workdays), 6 (injuries without lost workdays), 9 (illnesses with lost workdays), and 13 (illnesses without lost workdays); and for year 2002 and later, the sum of OSHA 300 columns H (cases with days away from work), I (cases with job transfer or restriction), and J (other recordable cases).

3 Where N = for year 2001 and earlier, the sum of OSHA 200 columns 3 (injuries involving days away from work) and 10 (illnesses involving days away from work); and for year 2002 and later, OSHA 300 column H (cases with days away from work).

4 NA = not available.

Figure AttD-1. SAIC Occupational Injury and Illness Data

2000	2001	2002	2003	2004	2005
0	0	0	0	0	0 to date

Figure AttD-2. Number of OSHA Violations

SAIC is experienced in providing effective, proactive safety and health programs in the NASA environment. SAIC created and implemented safety and health plans for NASA's Ames Research Center, GSFC, Johnson Space Center, and Langley Research Center that have repeatedly passed formal government audits for compliance with all NASA policies and procedures. We have demonstrated our ability to flow down these requirements to our team members and to work effectively with them to ensure a safe and healthful environment for our employees and customers. The SAIC Team will bring this level of experience and teamwork to the GMAO contract.

To demonstrate our management commitment to implement this plan for the GMAO contract, the program manager will endorse the following state-

ment upon contract award as a condition to assuming that position:

The purpose of this Safety and Health Plan is to ensure that the SAIC Team, NASA employees, and associated contractors, customers, and equipment are protected. This plan will provide employees with operating procedures to protect themselves and the equipment, processes to obtain necessary safety training and report hazardous conditions, and information concerning their rights and responsibilities relative to occupational safety and health. As program manager, I accept personal responsibility to ensure that this plan, as approved by NASA, is implemented and that it is periodically reviewed and updated as necessary to ensure a safe, productive work environment.

INTRODUCTION TO THE SAIC TEAM SAFETY AND HEALTH PLAN

The SAIC Team Safety and Health Plan integrates the SAIC Corporate Environmental Compliance and Health and Safety Program (EC&HS) and NASA safety and health requirements into a strong, effective, GMAO Safety and Health Program (see figure

AttD-3). It will provide documented performance against federal, NASA, and state safety mandates in which the interests of both the customer and the contractor are satisfied.

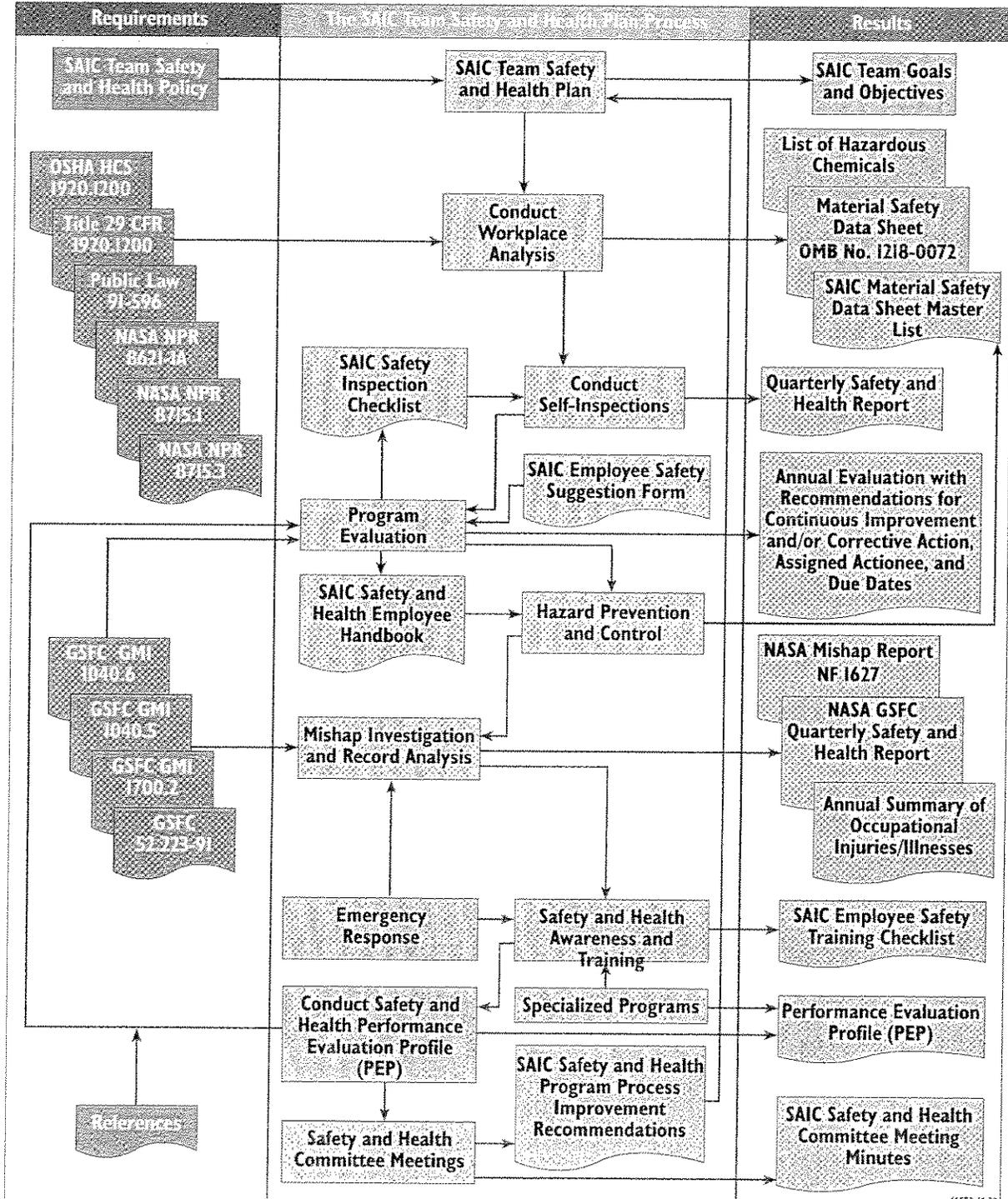


Figure AttD-3. SAIC Team Safety and Health Plan Process

J6520-M-30

I. SAFETY PROGRAM MANAGEMENT

I.1 Policy

SAIC's policy is to operate in compliance with all OSHA, federal, state, and local environmental health and safety rules and regulations and to comply with GSFC's regulations, policies, procedures, and any reasonable safety or occupational health guidance or direction. We are dedicated to providing a safe and healthful environment for our employees, protecting the public, and preserving SAIC assets and property. We consider the health and safety of all employees, including those of associated contractors and NASA, to be of prime importance. We are committed to our employees and team members supporting the GMAO contract to provide a safe and healthful working environment in which they may prosper personally and professionally. We understand that:

- Our most valuable resources are the people who work for and with us. We believe all mishaps are preventable. To achieve this objective, we will implement a safety program that will benefit the company and our employees and hold safe the interest of the government.
- Management is responsible for safety and health. This program will help our management and nonsupervisory employees control hazards and risks, which will minimize GSFC site injuries to our employees at GMAO and damage or destruction of NASA and SAIC property. The foundation of our program is this Safety and Health Plan.
- All team employees, whether from SAIC, Science Systems and Applications, Inc. (SSAI), Oologah Technologies, Inc. (OTI), Harmony Careers International, Inc. (HCI), Muniz Engineering, Inc. (MEI), Earth Resources Technology, Inc. (ERT), I. M. Systems Group, Inc. (IMSG), are responsible for working safely and ensuring the safety of their fellow employees. Working safely is a condition of employment.
- Management is responsible for measuring and ensuring safety performance goals and objectives.

This document describes the Safety and Health Plan, which outlines the Safety and Health Program's implementation, including health benefits, safety responsibilities, and training requirements.

I.2 Goals and Objectives

The goals of the Safety and Health Plan are to maximize the health and well-being of SAIC Team

employees assigned to support the GMAO contract and to minimize the risks associated with their working environment. In addition, we will assist GSFC in becoming a nationally recognized center for excellence in safety and health.

Promoting a safe and healthful work environment involves instilling in employees an attitude that safety comes first and takes priority over operating productivity. Our leaders and staff must work as a team and always be aware of their surroundings, including the potential hazards associated with their jobs. In a cooperative environment, the objectives of the Safety and Health Program will be to:

- Heighten the awareness of SAIC Team personnel concerning health and safety issues related to GSFC GMAO contract efforts
- Maximize the safety and health awareness of our employees by providing health and safety training to all employees
- Minimize the risks associated with the working environment by inspecting the workplace regularly to identify and report hazards and track appropriate corrective actions to closure
- Create and maintain an injury- and mishap-free environment
- Conduct a prompt investigation and review of every workplace mishap to determine its cause and to help NASA GSFC prevent recurrences.

The SAIC Team will use NASA's PEP to assess the efficacy of the Safety and Health Program. At the inception of the contract and annually thereafter, the SAIC Team GMAO site supervisor (see Section 1.3.1) and the SAIC designated safety official (DSO) (see Section 1.5.4) will conduct a NASA PEP survey of the GMAO site. We will provide copy of the results, in the form of an OSHA Form 195 prepared by our GMAO facilities safety representative (the SAIC Team GMAO program manager) to NASA and the contracting officer's technical representative (COTR) no later than 30 days after the contract anniversary date each year.

I.3 Management Leadership

The responsibility for implementing the plan is with management. However, all SAIC Team GMAO employees will be responsible for identifying hazards and correcting those directly within their power to do so. The SAIC Team program management will

ensure that our employees receive the training necessary to accomplish the plan requirements and that corrective actions are taken when necessary. We will include this plan in all potential subcontractor agreements related to this proposal.

1.3.1 Program Manager

We will designate the SAIC Team GMAO program manager as the SAIC Team GMAO site supervisor, who will primarily be responsible for administering the plan for all employees assigned to the contract. As the GMAO site supervisor, the program manager will ensure that regular inspections, safety training, and safety briefings are conducted for the GMAO contract site. In addition, the program manager will serve as the SAIC Team GMAO facility safety representative, with the authority and responsibility to conduct these functions at the GSFC site as defined by RFP NNG05072010R.

1.3.2 Facility Safety Representatives

The SAIC Team GMAO program manager will designate the SAIC Team GMAO facility safety representative(s), as necessary, for the GSFC site (in Greenbelt, Maryland), who will be responsible for the general condition of that area and have the authority to take or initiate corrective action when an unsafe condition exists. She or he will be responsible for ensuring the SAIC Team's adherence to center-wide safety, health, environmental, and fire protection concerns and goals and will participate in meetings and other activities related to the center's Safety and Health Program.

At the GSFC in Greenbelt, the SAIC Team GMAO program manager, normally residing in Building TBD, will serve as the SAIC Team's GSFC facility safety representative as well as the SAIC Team's fire warden for that building. The program manager may delegate this duty for this building but is still responsible for the facility's safety.

We anticipate that the principal place of performance for the SAIC Team's work for this contract will be at GSFC in Greenbelt, Maryland; however, we may complete some tasks at remote sites using networked resources. We also anticipate travel and work at remote sites as possibilities. For remote-site work, we will designate a facility representative with the same duties and responsibilities as the on-site facility safety representative at GSFC.

1.3.3 SAIC Team Group Leads

The SAIC Team group leads will be key in implementing and enforcing the safety and health policies and procedures, including providing the initial orientation for our new employees and identifying and providing ongoing training, as required, for our employees to perform their job duties. Our GMAO Team group leads are personally responsible and held accountable for ensuring that the work areas they control are safe and healthful for our employees. These supervisors will fulfill their responsibility by:

- Being knowledgeable of the safety and health hazards and controls in their area of responsibility
- Ensuring that our employees are informed of the SAIC Team GMAO Safety and Health Plan and receive effective safety and health training as needed
- Properly supervising our employees to ensure that standards in safety and health performance are maintained and documented in a Web-based management information system (see Section 1.5.6)
- Enforcing NASA and SAIC Team safety and health rules as they relate to our staff
- Instructing our employees to report hazardous conditions to their supervisors
- Reminding our employees that they must become familiar with any health and safety plans affecting their GMAO work sites
- Investigating close calls and mishaps for root cause and monitoring the appropriate corrective action
- Demonstrating safety leadership by setting proper examples and taking responsive, corrective action if safety problems are identified.

1.3.4 Employees

Each SAIC Team employee is responsible for maintaining awareness of NASA and SAIC Team health and safety issues and to continually contribute to the success of this plan. The SAIC Team will train our employees to improve their ability to discern risks and possible hazards. The safety training will clearly outline the procedures for reporting and correcting hazards. We will instruct all employees to keep their work areas free of hazards. Employees must report unsafe conditions that are not correct-

able to the SAIC Team GMAO program manager or their group lead immediately after identifying the condition.

Employees are accountable for:

- Complying with all GSFC and SAIC Team safety rules
- Knowing the members of the SAIC Team GMAO Safety and Health Committee
- Becoming familiar with fire safety and escape procedures from their areas of work
- Keeping up to date on safety plans and procedures affecting their work areas, including relevant evacuation plans
- Keeping work areas neat and orderly
- Reporting all workplace safety and health hazards to their supervisors and the NASA safety representative
- Reporting all workplace injuries and illnesses, no matter how minor, to their supervisors
- Following any NASA safety regulations governing their work sites.

1.4 Employee Involvement

Employee involvement is the cornerstone of the SAIC Team Safety and Health Program. By participating, employees gain an understanding and a sense of ownership for safety and health issues. Examples of participation include:

- Volunteering as facility safety representative for a building
- Volunteering as a building fire warden
- Developing and presenting a safety, health, or environmental training “short”
- Performing a job hazard analysis
- Performing self-inspections
- Participating in corporate, contract, GSFC, and contractor safety, health, and environmental activities
- Assisting in close call or mishap investigations
- Participating in GSFC Safety Committee and sub-committee meetings, as appropriate.

1.5 Assignment of Responsibility

The SAIC operation manager is responsible for the SAIC Team Safety and Health Plan implementation for the GMAO contract. He has delegated the day-to-day responsibility for this activity to the SAIC Team GMAO program manager, an SAIC employee reporting directly to the SAIC General Science Operation (GSO) vice president and division

manager. The SAIC Team GMAO program manager holds the GMAO group leads responsible for implementing the SAIC Team Safety and Health Plan within their areas of responsibility. Our SAIC Team GMAO employees are responsible for safety and health awareness as outlined in this plan. In addition, we will establish the specific designations shown in figure AttD-4.

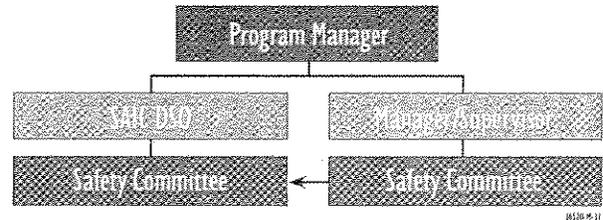


Figure AttD-4. SAIC's Safety Organization

1.5.1 Facility Safety Representative

SAIC will name an SAIC Team GMAO facility safety representative, per Section 1.3.2 of this plan, for all buildings we occupy. The facility safety representatives will be responsible for the SAIC Team's adherence to GSFC-wide safety, health, environmental, and fire protection concerns and goals, and they will participate in meetings and other activities related to the center's Safety and Health Program as appropriate.

1.5.2 Company Physician

SAIC does not have a company physician for this site. We anticipate that employees can use the GSFC Health Unit and enroll in a health insurance program and select their physicians individually within that program. The SAIC DSO (see Section 1.5.4) will conduct all contacts related to communicating medical data with NASA's clinic. Off-site employees will use their own selected physicians.

1.5.3 Building Fire Wardens

The SAIC Team GMAO program manager will designate an SAIC Team building fire warden from the ranks of the local group leads for any buildings we occupy. We also will identify alternate fire wardens for each building.

1.5.4 Designated Safety Official

Upon contract award, SAIC will designate an SAIC DSO to implement this plan from the SAIC corporate perspective and maintain all formal contacts with regulatory agencies and GSFC Safety and Environmental Branch, Code 205.2. Similarly, all

subcontractors will name DSOs who will serve on the GMAO Safety and Health Committee and be responsible for NASA-required corporate reporting through SAIC.

1.5.5 Notification of Change in Responsibility

SAIC will notify the contracting officer and GSFC's Safety and Environmental Branch, Code 205.2, of any DSO safety representative replacement within 30 days.

1.5.6 SAIC Web-Based Information System

The system includes a Web page that links to appropriate documentation for all safety and health documentation, as well as links to all Web-based NASA and GSFC emergency instructions, documentation, policies, and procedures, including federal regulations and safety procedures that apply to each work area. We will keep records for at least 3 years beyond the period of the contract or longer, if required by regulation.

1.6 Provision of Authority

We derived the authority for this Safety and Health Plan from OSHA, Environmental Protection Agency (EPA), state, and local requirements. SAIC management personnel are responsible for implementing the GMAO plan in accordance with the following:

- Title 29 Code of Federal Regulations Part 1910
- NPD 8710.2D, NASA Safety and Health Program Policy (Revalidated April 28, 2004)
- NPR 8715.1, NASA Safety and Health Handbook—Occupational Safety and Health Programs with change 2 (March 30, 2004)
- NPR 8715.3 NASA Safety Manual with change 2 (March 31, 2004)
- GSFC GMI 1700.2, GSFC Safety and Health Program
- GSFC GHB 8800.2, GSFC Environmental Handbook.

Because the primary place of business for execution of this contract is in Greenbelt, Maryland, all local regulations, in addition to those embodied in Federal Occupational Safety and Health Act provisions, will apply and be enforced.

1.7 Accountability

The SAIC GSO operation manager has included compliance with the provisions of this Safety and

Health Plan as part of the performance appraisal and evaluation for the SAIC Team GMAO program manager, who, in turn, will ensure that this compliance is part of the performance appraisal and evaluation for all SAIC Team GMAO group leads and personnel. Participation in safety and health activities is included in all potential subcontractor agreements related to this proposal. The SAIC DSO will periodically visit the GMAO sites where our employees work, discuss safety issues with the local SAIC Team GMAO facility safety representative, and verify compliance with the provisions of this Safety and Health Plan.

1.8 Program Evaluation

To confirm the efficacy and success of the GMAO Safety and Health Program, SAIC will measure safety and health performance using both leading and training metrics. SAIC will report the results in quarterly safety and health reports, specifying incidents, disabling injuries, lost work days, incident rate, property damage and cost, manhours worked per month, and total employees in accordance with the template provided at <http://safety1st.gsfc.nasa.gov/contr.html>. In addition to keeping the plan up to date, the SAIC Team will evaluate the plan on the anniversary of contract award to ensure that the GMAO contract safety and health goals are being met. This annual evaluation will consist of two separate activities. During the first, the SAIC Team will conduct a NASA-type PEP survey (see Section 1.2). Second, the SAIC Team GMAO Safety and Health Committee (see Section 1.9), composed of employees of SAIC, SSAI, OTI, HCI, MEI, ERT, IMSG, will evaluate the overall Safety and Health Program using the results of the PEP survey as one performance metric. This committee will discuss possible changes to the goals and objectives, implementation, or administration of the plan and recommend any changes to management. The SAIC management may then approve changes and assign a responsible corporate officer to implement the modifications. We will store any plan modifications or updates in the Web-based information system for access by all GMAO employees.

When NASA requests a written program evaluation, the SAIC Team GMAO Safety and Health Committee will produce and deliver it to NASA no later than 30 days after the end of each contract year or at the end of the contract, whichever is applicable.

1.9 Documentation of Safety and Health Program Performance

In order to document and provide the government with the necessary visibility and insight to the SAIC Team's Safety and Health Program, the SAIC Team will maintain and support an SAIC Team GMAO Safety and Health Committee composed of a cross-section of SAIC Team GMAO employees from all SAIC Team companies. The SAIC Team GMAO Safety and Health Committee will function as an evaluation and advisory group to develop and recommend to the SAIC Team GMAO and NASA management matters of policy and procedure affecting administration of the GSFC's SAIC Team GMAO Safety and Health Programs. The group will involve representatives from each SAIC Team company, including the following:

- SAIC Team GMAO employees (two representatives at large)
- GMAO corporate DSO
- SSAI corporate DSO
- OTI corporate DSO
- HCI corporate DSO
- MEI corporate DSO
- ERT corporate DSO
- IMMSG corporate DSO
- SAIC Team GMAO group leads (two representatives at large).

The SAIC Team GMAO program manager will designate the SAIC Team GMAO Safety and Health Committee chairperson. The list of the SAIC Team GMAO Safety and Health Committee members, their telephone numbers, and e-mail addresses will be posted in the Web-based information system and in a conspicuously central location in any buildings we occupy. The committee will meet at a mutually convenient time, at the request of any member of the committee, but not less than quarterly. The chairperson will prepare minutes of the meeting, which will be posted in the Web-based information system and filed for future reference and inspection by authorized NASA official or any member of the SAIC Team. The committee is responsible for:

- Reviewing the SAIC Team's statistical data, records, and reports on safety matters to determine the effectiveness of overall mishap and loss prevention efforts and to develop recommendations for improvement

- Reviewing and analyzing the SAIC Team GMAO mishap and property loss investigation reports for accuracy and completeness (recommending follow-up investigation if necessary)
- Recommending corrective actions and providing consistency throughout the SAIC Team GMAO operations
- Identifying mishap problems or trends and determining what order they should be given attention
- Reviewing the SAIC Team GMAO safety and property inspection reports, job safety analyses, supervisor's safety observation reports, close call reports, and employees' safety suggestions (Safety Suggestion Form) in context of the need for:
 - Possible changes in work practices or procedures
 - Safety procedures
 - Protective devices or equipment
 - Training.
- Developing practical SAIC Team GMAO inspection procedures for safety and property and participating in GSFC safety and health inspections
- Informing the SAIC Team GMAO group leads of program progress and the safety records of our employees working in the GMAO or other areas of GMAO activities
- Assisting in developing the SAIC Team records and statistical data necessary to provide an accurate picture of GMAO safety issues and documenting them in the Web-based information system
- Identifying unsafe work practices and conditions and suggesting appropriate remedies and ensuring that our employees are informed about safety policies, training programs, injury risks and causation, and other health and safety-related matters
- Reviewing the GSFC Material Safety Data Sheets (MSDS) and Hazardous Material Inventory (see Section 1.9.2) to ensure that we are aware of those relating to the GMAO area where our employees work
- Maintaining an open channel of communication between our employees and management concerning occupational and environmental health and safety matters

- Enabling our employees to use their knowledge of workplace operations to advise the SAIC Team management in improving policies, conditions, and practices
- Conducting the quarterly self-inspection (see Section 2.2) and review of corrective actions taken, including the status of identified hazards (see Section 2.1)
- Conducting the annual program evaluation and report (see Section 1.8).

1.9.1 Roster of Terminated Employees

SAIC will send a report listing all employees terminated during each contract year to the GSFC Occupational Health Program officer no later than 30 days after the end of each contract year or at the end of the contract, whichever is applicable. The report will contain the following information:

- Date of report, contractor identity, and contract number
- For each person listed: name, social security number, assigned headquarters badge number, and date of termination
- Name, address, and telephone number of contractor representative to be contacted for questions or other information.

1.9.2 Material Safety Data and Hazardous Materials Inventory

Because we will conduct most of the work performed for this contract in government's facilities using government-furnished equipment (GFE), SAIC is required to provide a list of known hazardous materials associated with the performance of the contract to Code 205.2. SAIC will request permission from the contracting officer to conduct a survey during the contract phase-in period. (see Section 2) The inventory will include the identity of the material, the location of the material (by building and room), and the quantity of each material normally kept at each location. If SAIC Team GMAO employees need to introduce hazardous materials to perform this contract, we will inventory and report the materials to the appropriate NASA officials per Section 2.1.1, List of Hazardous Chemicals. We will submit the MSDSs for materials SAIC introduces to a GMAO facility to Code 205.2 and maintain and distribute them in accordance with Section 2.1.2 of this document.

1.10 Government Access to Contractor Safety and Health Program Documentation

So that the government may monitor the performance of its Safety and Health Program, SAIC will provide to the NASA COTR copies of the Safety and Health Plan, all amendments to that plan, and all reports generated in compliance with the directives of that plan. SAIC will make safety and health records and documentation (including relevant personnel records) available for inspection or audit at the government's request and also will furnish a roster of terminated employees and material safety data for any potentially hazardous materials to be used at the sites. We will store this documentation in the Web-based information system.

1.11 Review and Modification of Safety Requirements

The SAIC Team will update the SAIC Team GMAO Safety and Health Plan, as necessary, and will participate in reviews of new NASA safety requirements as those become available, including review of the appropriate documents as authorized and directed by the GMAO contract COTR. We will orient every employee the SAIC Team employs under this contract to work in the GSFC's GMAO on this SAIC Team GMAO Safety and Health Plan. As we make updates to the plan, we will inform each SAIC Team GMAO employee of the updated information. The current electronic copy of the plan will be available online in a Web-based information system. We will maintain a record of employee acknowledgement of any new chemical hazard introduced by SAIC or NASA (when the SAIC Team is notified of such introduction) into the workplace and associated safeguards. We will provide a copy of the updates or updated plan to the GSFC's Safety, Environmental, and Security Office, Code 205.2, and the contracting officer.

1.12 Contractor Relationship with OSHA

SAIC is responsible for providing employees with a safe and healthful working environment that complies with Public Law 91-596, Occupational Safety and Health Act of 1970 and amendments. In addition, SAIC complies with the OSHA Hazard Communication Standard, Title 29 Code of Federal Regulations 1910.1200, by using MSDSs (see Section 1.9.2), compiling a hazardous chemicals list, ensuring that



SAIC-provided containers are labeled, and training each SAIC employee. We will maintain a record of SAIC employee acknowledgement of chemical hazard data and safeguards related to GMAO contract work. SAIC will submit a timely reply to any OSHA citation we receive and will be responsible for settling citations issued against the operation unless specifically addressed in the contract.

I.13 Procurement

The government will conduct all on-site procurement activities according to the appropriate and applicable GSFC rules. The SAIC Team will support the procurement activity as requested by NASA and will ensure that safety tasks are clearly stated in all potential subcontracts.

SAIC Team GMAO Safety Suggestion Form

Name _____ Date _____
(Optional)

Location _____

Description of Hazard, Close Call, Unsafe Condition or Practice:

Probable Cause or Contributing Factors:

Suggestion for Improving Safety:

Draw a Picture to Describe Situation:

Place this form in the mailbox of your SAIC Team GMAO supervisor or of any member of the SAIC Team GMAO Safety and Health Committee.

2. WORKPLACE ANALYSIS

The SAIC Team will perform a workplace analysis of workspaces as described by the RFP NNG05072010R upon award of the contract. To ensure a safe workplace for our employees for the duration of the contract, the SAIC Team will systematically survey work sites and the activities of our employees at those locations to provide a comprehensive picture of our Safety and Health Plan implementation. Our initial and most important method of work site hazard identification is our Hazard Assessment for Local Office tool (Appendix B). SAIC developed this tool to assist managers and DSOs in implementing their Safety and Health Program. We will perform this work site survey before the contract start date, during the phase-in period. The survey will provide baseline information and assumptions for our safety and health plan and will help us identify basic safety-critical events and on-site hazards. The plans we create as a result will vary according to the basic risk types identified in the assessment:

Low-risk: Directed to locations with “office only” exposures related to paper studies, not to potentially hazardous off-site work

Tailored: Directed to two types of locations:

- Those with only minimal on-site or off-site environmental and/or safety exposures that can be addressed with slight modification of the low-risk program
- Those presenting environmental and/or safety exposures that require an EC&HS program specifically tailored to their needs.

SAIC anticipates that the work associated with the GMAO contract will be low-risk.

Because most of the tasks defined under this RFP will be conducted in NASA facilities, the SAIC Team will coordinate with NASA to maintain the facility structure in accordance with NASA regulations and will report unsafe situations related to tasks defined under this RFP. In the course of conducting this contract, the SAIC Team will work jointly with NASA’s safety authorities to ensure seamless coordination between the SAIC Team GMAO Safety and Health Plan’s implementation and any established NASA safety directives and procedures. For off-site facilities, SAIC will work with SAIC corporate

EC&HS officials as well as the appropriate subcontracted vendors, including facility and office automation representatives.

If an SAIC Team GMAO employee identifies a hazard on NASA property that pose immediate danger to life or health, it will be reported by the task manager/DSO immediately to GSFC’s Safety, Environmental, and Security Office, Code 205.2 and the SAIC Team DSO. At off-site facilities, employees will report to their task leader, the task manager, or the appropriate facility safety representative. All SAIC Team employees will have the right to call a “stop work” for activities they believe pose a hazard to themselves, other employees, equipment, the environment, or facilities. The SAIC Team will perform hazards analyses, specifically job safety analyses, for all task operations. For example, we will perform a common office spaces job safety analysis that will address all common office space hazards as well as those specific to tasks such as electrical equipment maintenance (board changes, etc.). We will use our job safety analyses as the basis of our operating procedures for protective equipment, caution/warning/danger notes for specific hazards, and environmental considerations (e.g., hazardous waste handling/disposal) as required. All safety engineering products that address operations, equipment, etc., on GSFC property will be subject to the review and concurrence of the Safety, Environmental, and Security Office, Code 205.2, unless otherwise specified in the approved SAIC Team GMAO Safety and Health Plan.

Authorized NASA representatives will have access to and the right to examine the site and areas where work is being performed to determine the adequacy of our safety and health measures in ensuring a safe and healthful working environment for our employees.

Upon award of the contract, we will inspect all facilities used to perform tasks designated by the contract for the presence of hazardous conditions that may interfere with the performance of this contract. To establish a baseline for operations, SAIC Team GMAO Safety and Health Committee members will survey all properties for any non-compliant conditions per Section 2.2, Self-Inspections.

In the event of a mishap, the SAIC Team will investigate the mishap and record our analysis of the event per Section 3.0, Mishap Investigation and Record Analysis. We will rank and mitigate every hazard we identify by any technique in accordance with appropriate GSFC (on-site hazards) or SAIC (off-site hazards) procedures. We will immediately report all hazards that pose immediate danger to life or health to the GSFC Safety, Environmental, and Security Office Code, 205.2, the SAIC Team DSO, the task manager, and corporate EC&HS and will take action as outlined in Appendix B, Emergency Action Plan, as necessary. We will document the results of these investigations in a Web-based information system, Sharepoint.

The SAIC Team DSO will collect injury and illness data for the duration of this contract, including from any subcontractors working on the SAIC Team and will report those statistics to the appropriate NASA official.

2.1 Hazard Identification

NASA and the SAIC Team will jointly decide which operations are to be considered hazardous, with NASA as the final authority. As part of the phase-in period, the SAIC Team program manager will supervise a comprehensive ("wall-to-wall") survey of the work site(s), including facilities, equipment, processes, and materials (including waste). The SAIC Team program manager will supervise a change analysis survey at any time during the contract when NASA modifies facilities, equipment, processes, materials, and/or any related procedures for operations and maintenance that affect SAIC Team employees. Before the SAIC Team commences any hazardous operations in the GMAO facility, the SAIC Team will conduct a hazard analysis that includes obtaining and researching the appropriate, written NASA hazardous operating procedures for all hazardous operations and/or qualification standards for personnel involved in hazardous operations. The SAIC Team will ensure that those procedures are followed using SAIC Team personnel that meet the qualification standards.

2.1.1 List of Hazardous Chemicals

The SAIC Team GMAO program manager will maintain a master list of all NASA-identified hazardous chemicals and related work practices applicable to GMAO operating areas. This list will also

identify the corresponding MSDS for each chemical. GSFC will approve any new hazardous chemicals the SAIC Team introduces at the GMAO site before use, and an MSDS approved by NASA will be available for inspection before any employee uses such chemicals. The SAIC Team GMAO S&H Committee will review the MSDS master list quarterly, update it as necessary, and document it in the Web-based information system (see Section 1.9).

2.1.2 MSDSs

MSDSs provide personnel with specific information on the chemicals used. The SAIC Team GMAO program manager will maintain a binder with NASA-approved MSDS on every substance on the list of hazardous chemicals and will maintain an electronic copy in the Web-based information system. Each NASA-approved MSDS will be a fully completed OSHA Form 174 or equivalent. The SAIC Team GMAO program manager will ensure that each GMAO area maintains NASA-approved MSDSs for hazardous materials in that area and will make them readily available to any SAIC Team GMAO employee. The SAIC Team GMAO program manager is responsible for acquiring and updating MSDSs for hazardous materials introduced by the SAIC Team. NASA is responsible for updating MSDSs for materials introduced by NASA or other NASA contractors and providing them to the SAIC Team. The SAIC Team GMAO program manager will contact the chemical manufacturer or vendor if additional research is necessary or if an MSDS has not been supplied with an initial shipment introduced by the SAIC Team.

2.1.3 Labels and Other Forms of Warning

The SAIC Team GMAO program manager will ensure that all hazardous chemicals the SAIC Team introduces into the workplace are properly labeled, with labels updated as necessary. Labels should list, at a minimum, the chemical's identity, appropriate hazard warnings, and the name and address of the manufacturer, importer, or other responsible party. The SAIC Team GMAO program manager will refer to the corresponding MSDS to assist each employee in verifying label information. Labels are required on portable containers.

2.1.4 Nonroutine Tasks

When SAIC Team employees are required to perform hazardous, nonroutine tasks (cleaning tanks, entering confined spaces, etc.), the SAIC Team will

perform a special assessment before commencing any such task to ensure that all hazards are identified and controlled and that employees are properly certified. We will conduct a training session to inform employees of the hazards they may encounter, and the precautions they must take to reduce and/or avoid exposure or danger.

2.1.5 Training

The SAIC Team GMAO program manager or an appropriate SAIC expert will provide initial and, if required, follow-on training on the Hazardous Communication Standard and the safe use of hazardous chemicals to all SAIC Team employees who work with or may potentially be exposed to hazardous chemicals. The SAIC Team GMAO program manager is responsible for providing initial and follow-on training to new employees as part of the normal personnel in-briefing. The training will provide employees with sufficient information to recognize hazards and identify ways of avoiding mishaps. Training will include general area safety information and specific job safety information, when applicable. The SAIC Team GMAO program manager will provide follow-on training if an employee's responsibilities change substantially and/or if she or he is relocated to a different work area. The SAIC Team GMAO program manager will document initial and follow-on training in the employee's file. Each new SAIC Team GMAO hire will be provided access to this S&H Plan. Whenever a new hazard is introduced, we will provide additional training as appropriate to address the new hazard and protective measures to be taken. We also will maintain a record of employee acknowledgement of any new chemical hazard introduced into the workplace and the associated safeguards. The training plan will emphasize the following components:

- A summary of the Hazardous Communication Standard and this written S&H Plan
- The chemical and physical properties of hazardous materials (e.g., flash point and reactivity) and methods that can be used to detect the presence or release of chemicals (including chemicals in unlabeled pipes)
- The physical hazards of chemicals (e.g., potential for fire and explosion), health hazards, including signs and symptoms of exposure to chemicals,

and any medical conditions known to be aggravated by exposure to the chemical

- Procedures to protect against hazards (e.g., personal protective equipment required, proper use and maintenance, work practices, methods to ensure the proper use, handling, and procedures for emergency response)
- Procedures to ensure protection when cleaning hazardous chemical spills and leaks
- The location of MSDSs, how to read and interpret information on labels and MSDSs, and how SAIC Team employees may obtain additional hazard information
- Information on the interpretation of common chemical classifications and warning signs.

2.1.6 Contractor Employees

The SAIC Team GMAO program manager will advise any outside contractors engaged by the SAIC Team of any chemical hazards that may be encountered in the normal course of work on GMAO contract premises, the labeling system in use, protective measures to be taken, and safe handling procedures. In addition, the SAIC Team GMAO program manager will notify outside contractors of the location of all MSDSs. Any SAIC Team-engaged contractor bringing chemicals onto GMAO contract premises must first provide the SAIC Team with the appropriate hazard information on these substances, including the labels used and the precautionary measures to be taken in working with these chemicals. The SAIC Team will obtain NASA's prior approval for any introduction of chemical hazards on the part of an SAIC Team-engaged outside contractor.

2.2 Self-Inspections

The SAIC Team GMAO program manager and the SAIC Team GMAO S&H Committee will lead the effort to identify, evaluate, and prevent occupational S&H hazards. The initial formal inspection will be conducted upon initiation of the contract and quarterly thereafter. Inspections will identify discrepancies between observed conditions and current requirements, as well as new (not previously identified) or modified hazards. The SAIC Team will maintain the results of these inspections in the Web-based information system. The SAIC Team GMAO S&H Committee will use the inspection checklist

during its work site inspection and analysis (see Section 1.9). The committee and the SAIC Team program manager (see Section 1.3.1) will focus on hazardous conditions noted on the checklist until the conditions are eliminated. SAIC will notify NASA of any hazardous conditions noted during the inspection. At a minimum, the committee and the SAIC Team GMAO program manager will:

- Review applicable safety orders and announcements that apply to the operation
- Address safety information in safety training, safety briefings, and monthly staff meetings
- Review industry and general information related to potential occupational S&H hazards
- Investigate all mishaps, injuries, illnesses, and unusual events that have occurred to SAIC employees at the location and document the incident, using NASA Form 1627; check documentation for related SAIC incidents; and implement improvements to prevent future events, if applicable
- Conduct periodic and scheduled inspections of the general work areas and workstations (monthly) where SAIC employees are assigned
- Evaluate information SAIC employees provide
- Recommend corrective action when a hazard is discovered
- Ensure that all SAIC Team employees update any SAIC Team standard operating procedures (SOP) and other operational manuals to reflect safety considerations; describe the hazardous situations and the necessary precautions, where appropriate

- Identify work in the contract that might involve hazardous materials, and if found, the SAIC Team GMAO program manager and NASA will establish controls over the procurement, storage, issuance, and use of hazardous substances and establish procedures to recycle and dispose of hazardous waste.

We will provide copies of the inspection and evaluation records and corrective measures to the GSFC's Safety and Environmental Branch, Code 205.2, no later than 5 working days after we complete the inspection/evaluation; we will maintain the records in the Web-based information system.

2.3 Employee Reports of Hazards

SAIC Team employees are required to report all workplace hazards they identify. We will give employees the SAIC Team GMAO Safety Suggestion form to use. The form and an explanation of its use will be available in the Web-based information system. The form explicitly states that reporting health and safety hazards will not jeopardize an employee's position on the contract. The employee also may submit the form anonymously to ensure confidentiality. The SAIC Team GMAO S&H Committee will formally discuss the status of all SAIC Team GMAO safety suggestions during its quarterly meetings and document the discussion in the quarterly report. We will formally track, investigate, identify corrective action, and complete documentation to close all reports. We will provide feedback directly to the submitter; if the submitter was anonymous, we will document the feedback in the safety committee minutes posted for access by all SAIC Team employees.



Material Safety Data Sheet U.S. Department of Labor			
May be used to comply with OSHA's Occupational Safety and Health Administration Hazard Communication Standard 29 CFR 1910.1200. (Non-mandatory Form) Standard must be consulted for specific requirements Form Approved OMB No. 1218-0072			
Section I			
Manufacturer's Name		Emergency Telephone Number	
Address (Number, Street, City, State, and ZIP Code)		Telephone Number for Information	
		Date Prepared	
		Signature of Preparer (optional)	
Section II—Hazard Ingredients/Identity Information			
Other Limits			
Hazardous Components (Specific Chemical Identity: Common Name(s)) OSHA PEL ACGIH TLY Recommended % (optional)			
Section III—Physical and Chemical Characteristics			
{PRIVATE} Boiling Point		Specific Gravity (H ₂ O = 1)	
Vapor Pressure (mm Hg.)		Melting Point	
Vapor Density (AIR = 1)		Evaporation Rate (Butyl Acetate = 1)	
Solubility in Water			
Appearance and Odor			
Section IV—Fire and Explosion Hazard Data			
Flash Point (Method Used) {PRIVATE}	Flammable Limits	LEL	UEL
Extinguishing Media			
Special Fire Fighting Procedures			
Unusual Fire and Explosion Hazards			
(Reproduce Form Locally) OSHA 174, Sept. 1985			

Section V—Reactivity Data			
Stability	Unstable	Conditions to Avoid	
	Stable		
Incompatibility (Materials to Avoid)			
Hazardous Decomposition or Byproducts			
Hazardous Polymerization	May Occur	Conditions to Avoid	
	Will Not Occur		
Section VI—Health Hazard Data			
{PRIVATE} Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
Health Hazards (Acute and Chronic)			
Carcinogenicity:	NTP?	IARC Monographs?	OSHA-Regulated?
Signs and Symptoms of Exposure			
Medical Conditions Generally Aggravated by Exposure			
Emergency and First Aid Procedures			
Section VII—Precautions for Safe Handling and Use			
Steps to Be Taken in Case Material Is Released or Spilled			
Waste Disposal Method			
Precautions to Be Taken in Handling and Storing			
Other Precautions			
Section VIII—Precautions for Safe Handling and Use			
Respiratory Protection (Specify Type)			
Ventilation	Local Exhaust	Special	
	Mechanical (General)	Other	
Protective Gloves	Eye Protection		
Other Protective Clothing or Equipment			
Work/Hygienic Practices			

SAIC Team GMAO Safety Inspection Checklist

Inspected By: _____

Date: _____

Mark "N/A" as appropriate.

I. WORK SITE INFORMATION:

- a. Are OSHA and other work site warning signs posted?
- b. Are safety meetings conducted periodically?
When was the last meeting?
- c. Is first aid equipment properly stocked?
- d. Are work site injury records kept?
- e. Are emergency telephone numbers conspicuously posted?
- f. Is the EMERGENCY INFORMATION form posted?

Describe Violation—Location—Remedy Taken:

2. HOUSEKEEPING AND SANITATION:

- a. Are emergency lights fully operational?
- b. Are working areas neat?
- c. Are waste and trash regularly removed?
- d. Are passageways and walkways clear?
- e. Are waste containers provided and used?
- f. Are sanitary facilities adequate and clean?
- g. Is there an adequate supply of water?
- h. Is lighting adequate?
- i. Is there a trash receptacle for drinking cups?
- j. Are handrails and stair treads in good repair?
- k. Is smoking restricted to certain locations?
- l. Are electrical cords and plugs in good condition?
- m. Is a clearance of 3' maintained around hot water heaters, electric breaker panels, heating units, and fire sprinkler risers?
- n. Are electric circuit breakers free of obstructions?

Describe Violation—Location—Remedy Taken:



3. FIRE PREVENTION:

- a. Is fire prevention instruction provided to personnel?
- b. Is good housekeeping observed?
- c. Are the storage, use, and handling of flammable liquids properly done?
- d. Are fire hazards checked?

Describe Violation—Location—Remedy Taken:

4. HANDLING AND STORAGE OF MATERIALS:

- a. Are materials properly stored and stacked?
- b. Are passageways clear?
- c. Are shelves in stockrooms in good repair and properly anchored?
- d. Are stacks on firm footing, not too high?
- e. Are employees lifting loads correctly?

Describe Violation—Location—Remedy Taken:

5. HAZARDOUS MATERIALS:

- a. Do employees have access to a binder containing MSDS for supplies containing hazardous chemicals before using chemicals?
- b. Are "Material Safety Data Sheets Are Available on Request" signs posted in conspicuous locations?
- c. Are all containers clearly identified?
- d. Are proper storage practices observed?
- e. Are proper storage temperatures and protection observed?
- f. Are proper type and number of extinguishers nearby?

Describe Violation—Location—Remedy Taken:

UNSAFE ACTS OR PRACTICES OBSERVED:

SAIC Team GMAO Safety Inspection Checklist, Page 2 of 2

3. MISHAP INVESTIGATION AND RECORD ANALYSIS

3.1 Mishap Investigation

Any mishap involving an SAIC Team employee will be reported immediately by telephone and confirmed by fax or e-mail, both to NASA and the SAIC Team management. The DSO also will inform SAIC corporate EC&HS and local human resources representatives. Mishap information pertaining to SAIC Team employees will be maintained for detailed analysis in a Web-based information system to continue improvement of mishap avoidance techniques. The two reporting forms discussed below ensure that NASA receives complete information about all mishaps involving SAIC Team personnel. The SAIC Team will investigate all work-related mishaps, incidents, and close calls involving SAIC Team employees to determine their root causes and provide the contracting officer; the GSFC's Safety and Environmental Branch, Code 205.2; SAIC corporate EC&HS; and local human resource representatives with 24-hour and 5-day mishap reports (see Section 3.1.3, NASA Mishap Reporting Forms), investigative findings, and proposed or completed corrective actions.

3.1.1 Mishap Reporting

In addition to immediately warning and advising other employees of the mishap and notifying emergency personnel, the affected SAIC Team employee (or an unimpaired cognizant SAIC Team employee) immediately must notify his or her SAIC Team task leader or the SAIC Team GMAO program manager in the case of fire, hazardous material, release, or other emergencies. After ensuring that any injured SAIC Team employee receives treatment, the SAIC Team GMAO program manager immediately will report the mishap verbally to the GSFC Safety and Environmental Branch, Code 205.2, and confirm by e-mail or fax. The program manager will report the occurrence to NASA management through the COTR, using NASA Form 1627 "Mishap Report" and the Supervisor's Accident Report to SAIC corporate EC&HS website. In cases involving SAIC Team employees, the SAIC Team GMAO program manager will conduct a complete evaluation and investigation of the incident, detailing the finding on OSHA Form 301 or substitute (see Section 3.1.4), and will provide a copy of the report to the SAIC Team GMAO S&H Committee and store it in the GPT system.

Immediately upon receiving notice of a fatality or serious injury or illness affecting an SAIC employee, temporary employee, or payrollee during a work-related activity, SAIC personnel must report the event to one of the following Corporate Environmental Compliance & Health and Safety (EC&HS) personnel:

Gary Waggoner 858-826-4355 (office); 858-354-4468 (cell)

Jim Price 858-826-4359 (office); 858-967-2731 (cell)

Kurt Schmidt 858-826-3686 (office); 858-967-2733

Chris Sweet 703-676-6515 (office); 703-929-5350

This requirement is necessary to ensure timely reporting (i.e., within 8 hours of employer knowledge) of these events to OSHA (or an authorized state program) as required by regulation. Corporate EC&HS is responsible for determining specific jurisdictional requirements for reporting and ensuring that these reports are made.

A "serious injury or illness" for purposes of the internal reporting requirement to Corporate EC&HS is defined as an accident occurring at work (or in the performance of work-related duties) that requires inpatient hospitalization for longer than of 24 hours except for medical observation, or in which an employee suffers a loss of any member of the body or suffers any serious degree of disfigurement. The resulting inpatient hospitalization may not necessarily occur immediately following the accident, but may happen days or months later (e.g., where later surgery is determined to be necessary), in which case our regulatory obligation to report may be triggered at that time. Clearly, timely communication among human resources, workers' compensation/disability, and EC&HS personnel occur when such events become known.

Any fatality that occurs during a work-related activity must immediately be reported to Corporate EC&HS. A "fatality" for purposes of this reporting requirement includes, but is not limited to, a fatal heart attack experienced by an employee that occurs at work (or in the performance of work-related duties), even if the heart attack is not perceived as work-related. A heart attack that results in hospitalization (as discussed above), or later death, is likewise subject to reporting to Corporate EC&HS.

3.1.2 NASA Mishap Reporting Categorizations

In addition to the SAIC or the Office of Workers' Compensation mishap reporting categorizations and reporting procedures, we will classify and submit mishap reports related to SAIC employees according to listed classifications. We will submit all SAIC Team employee-related GMAO mishap reports to the GSFC's Safety and Environmental Branch using NASA coding of incidents in accordance with the following specified classifications:

3.1.2.1 Type A Mishap

A Type A Mishap involves death or damage to equipment or property equal to or greater than \$1 million. Type A mishaps include events resulting in damage to aircraft, space hardware, or ground support equipment that meet these criteria and test failures with unexpected or unanticipated damage.

3.1.2.2 Type B Mishap

A Type B Mishap results in permanent disability to one or more persons, hospitalization (within a 30-day period from the same mishap) of three or more persons, or damage to equipment or property equal to or greater than \$250,000, but less than \$1 million. Type B mishaps include events resulting in damage to aircraft, space hardware, or ground support equipment that meet these criteria and test failures with unexpected or unanticipated damage.

3.1.2.3 Type C Mishap

A Type C Mishap results in damage to equipment or property equal to or greater than \$25,000, but less than \$250,000, or occupational injury or illness that results in a lost workday case. Type C mishaps include events resulting in damage to aircraft, space hardware, or ground support equipment that meet these criteria and test failures with unexpected or unanticipated damage.

3.1.2.4 Mission Failure

A Mission Failure is a mishap that, in the judgment of the enterprise associate administrator and the associate administrator for safety and mission assurance, prevents primary NASA mission objectives described in the mission operations report or equivalent document.

3.1.2.5 Incident

An Incident consists of less severe personal injury than a Type C mishap, but more than first-aid se-

verity, or property damage equal to or greater than \$1,000, but less than \$25,000.

3.1.2.6 Close Call

A Close Call is an event with no injury, minor damage (less than \$1,000) or less, with the potential to cause any type of mishap, injury, damage, or negative mission impact. A close call is not considered a mishap, but will trigger the mishap reporting, investigation, record keeping, and recurrence control guidelines.

3.1.3 NASA Mishap Reporting Forms

In addition to any required SAIC and Office Workers' Compensation claim forms, SAIC will provide NASA Form 1627 (Mishap Report), <http://safety1st.gsfc.nasa.gov/contr.html>, for mishaps involving SAIC Team employees to the GSFC's Safety and Environmental Branch, Code 205.2. SAIC will submit a NASA Form 1627A, <http://safety1st.gsfc.nasa.gov/contr.html>, Mishap Report, within 24 hours of all Type A and/or B mishaps and within 5 working days for Type C mishaps, incidents, and close calls. We will track all reports in the Web-based information system.

3.1.4 NASA 1627 (Per Incident)

If a mishap occurs involving an SAIC Team employee, we will complete a NASA Mishap Report (NASA Form 1627), <http://safety1st.gsfc.nasa.gov/contr.html>, in lieu of OSHA Form 301 and submit it according to the instructions on the form. The instructions describe mishap severity involving varying amounts of personnel and monetary losses. The SAIC Team GMAO program manager will ensure that this procedure is followed completely.

3.2 Trend Analysis

Our goal for the SAIC Team is zero recordable mishaps. Should recordable mishaps occur more than once per year, the SAIC DSO will implement the appropriate trend analysis and furnish the results to the NASA COTR and SAIC management. SAIC will give GSFC's Safety and Environmental Branch a summary of all mishaps and incidents involving SAIC Team employees, including lost-time frequency rate, number of lost-time injuries, exposure, and mishap dollar losses, trend analysis, and corrective actions by the 7th day of the month. The SAIC Team will submit a quarterly S&H report using the following form in conformance with the tem-



plate at <http://safety1st.gsfc.nasa.gov/contr.html>, we provide the illness statistical data described in Section 2, Workplace Analysis, and negative reports.

3.2.1 Mishap Summary Report

The SAIC DSO will notify and promptly report to the contracting officer, the GSFC's Safety and Environmental Branch, and SAIC corporate EC&HS and local human resources any SAIC Team employee-related mishap, incident, or exposure resulting in a fatality, lost-time occupational injury, occupational disease, contamination of property beyond any stated acceptable limits described in the contract schedule, property loss of \$25,000 or more, or close call that may be of immediate interest to NASA, arising out of work performed under this contract. SAIC is not required to include an expression of opinion as to the fault or negligence of any SAIC employee. In addition, SAIC will provide quarterly

reports specifying SAIC Team employee-related exposure hours, lost-time frequency rate, lost-time injuries, and mishap and incident dollar losses as specified in the contract schedule.

3.2.2 Record Keeping

The SAIC DSO will retain NASA Form 1627 (Mishap Report) to support development of the annual summary of occupational injuries. SAIC will deliver to GSFC's Safety and Environmental Branch and the contracting officer (under separate cover letter), a copy of our annual summary of occupational injuries and illnesses (or equivalent) as described in Title 29, CFR, Subpart 1904.5, or equivalent data. We will submit this report to GSFC's Safety and Environmental Branch by calendar year, within 45 days after the end of the year to be reported. We also will provide negative reports that will indicate that SAIC has had no reportable injuries or illnesses.

Science Applications International Corporation Quarterly Safety and Health Report for (month)-(month) 200X Contract No. RFP NNG05072010R							
Employees Full Time/On-Site GSFC—Buildings:							
	Month	Month	Month	Month	Month	Month	Month
INCIDENTS							
DISABLING INJURIES							
SEVERITY RATE							
DAYS LOST							
PROPERTY DAMAGE							
PROPERTY DAMAGE COST							
MANHOURS WORKED/MONTH							
TOTAL EMPLOYEES							
Name and number of person to call for further information:					Telephone:		

4. HAZARD PREVENTION AND CONTROL

4.1 Risk Management and Controls

SAIC Team employees working at GSFC normally will work in an office environment. The possible hazards of the office environment are few, but they do exist. SAIC Team GMAO employees will be responsible for recognizing these hazards and minimizing their possible adverse effects. In addition, SAIC Team GMAO employees will be trained and encouraged to identify office configurations or processes that may be modified to prevent a potentially injurious situation. The SAIC DSO and SAIC Team GMAO program manager will ensure that periodic scheduled inspections are performed. We will use the SAIC Team GMAO Safety Inspection Checklist for this purpose. SAIC Team employees who wish to remain anonymous may report unsafe conditions or hazards by submitting a SAIC Team GMAO Safety Suggestion Form to the SAIC DSO, the SAIC Team GMAO program manager, or their immediate SAIC Team group lead. Our employees must report unsafe conditions or practices immediately. None of our employees will be disciplined or discharged for reporting workplace hazards or unsafe conditions. Failure on the part of our employees to report obvious unsafe situations may result in disciplinary action, up to and including termination. The SAIC Team GMAO program manager will ensure that all MSDSs are up to date and accessible at the appropriate locations. In addition, she or he will ensure that SAIC Team employees are trained in the Hazard Communication Program before beginning work or changing job functions and will monitor the work site continuously to ensure that employees follow safe work practices. SAIC will authorize designated NASA representatives access to SAIC data necessary to verify implementation of control measures. For tasks performed on GSFC's facilities, NASA is solely responsible for facility maintenance and compliance with local regulations.

4.1.1 Hazardous Operations

SAIC Team employees will not be expected or allowed to participate in major hazardous operations (those requiring permits, special skills, or training) associated with the facility site. When such tasks (construction, electrical work, etc.) cannot be avoided and are duly authorized by NASA, they will be outsourced by the SAIC Team to appropriate qualified organizations. In an event that work is

conducted in an area where SAIC Team employees are affected, the SAIC Team GMAO program manager or the immediate group lead will inform them of such occurrence. We will identify any hazardous operations inherent to the performance of this contract with NASA during the phase-in period of the contract as defined in Section 2.0, Workplace Analysis, of this document. We will complete a job safety analysis on all hazardous operations and document hazardous operating procedures based on this analysis for employee training prior to operations.

4.1.1.1 Hazardous Communication Standard

The SAIC Team will make every effort to communicate all recognized hazardous situations to our employees as described in this plan. For situations identified during the initial site survey that involve hazardous materials use, the SAIC Team will attempt to have NASA substitute a nonhazardous or less hazardous material, if available.

4.1.1.2 Material Safety Data

The SAIC Team will notify GSFC's Safety and Environmental Branch of operations that could introduce hazardous materials into the NASA facility and will ask for concurrence to implement appropriate safety measures prior to operation commencement.

Should SAIC Team employees bring hazardous materials on or off site during the performance of this contract, the SAIC Team will provide and distribute MSDSs per Section 2.1.2 of this plan and file them in the facility per Section 1.9.2 of this plan.

4.1.1.3 Hazardous Materials Inventory

The SAIC Team will notify GSFC's Safety and Environmental Branch of operations that would require the introduction of hazardous materials into the NASA facility and will ask for concurrence to implement appropriate safety measures prior to operation commencement.

Should SAIC Team employees bring hazardous materials on or off site during performance of this contract, we will enact Section 2.1.1, List of Hazardous Chemicals, of this plan.

4.1.2 Written Procedures

The SAIC Team will maintain and update continuously all written procedures in the Web-based information system.

4.1.2.1 *Procedures for General Hazard Avoidance*

The SAIC Team will train employees to observe the following measures:

- Offices, aisles, and passageways must be kept clear and in good repair with no obstructions across or in aisles that could create hazards.
- Hazards will be prominently marked with appropriate labels, signs, or other devices to minimize the chance of mishap.
- Exits will be well marked and free of obstacles at all times.
- Power strips and power cords will be placed with consideration to minimize tripping.
- Individual offices, passageways, storerooms, and other areas will be kept clean and orderly, because excessive loose paper, disorderly journals and books, and stored cardboard boxes and crates can contribute significantly to the rapid spread of fire.
- Storage areas must be kept free from accumulation of materials that constitute hazards or harbor pests.
- All work areas should be periodically examined for tripping hazards and hazards found should be eliminated, including poorly placed electrical and telephone wire, wires running across aisle areas, and improperly stored equipment.
- The tops of all storage cabinets should be cleared of items that might cause injury. Shelves and cabinets must be periodically checked to ensure that they are not overloaded.

4.1.2.2 *Procedure for Dealing with Fire*

Fire is probably the hazard with the greatest potential for harm. The office environment contains many fire hazards that can be controlled with minimal effort, including paper and other combustibles, cleaning fluids and other chemicals, and electrical equipment.

4.1.2.3 *Prevention Measures to Substantially Reduce the Risk of Fire*

The SAIC Team will discuss prevention measures in our safety training. Smoking will never be permitted in the office space or the building. Designated smoking areas at GSFC will be the responsibility of NASA. For off-site locations, the SAIC facility safety representative will coordinate with local facility management to determine appropriate des-

ignated smoking areas. Electrical equipment will be kept in good repair, and equipment not in frequent use will be unplugged.

4.1.2.4 *Preventing the Spread of Fire*

SAIC Team employees will reduce the likelihood of fire acceleration by adhering to the following measures:

- Paper and combustible materials will not be allowed to accumulate
- Large accumulations of burnable material will be stored in fireproof cabinets
- Employees will be made aware of the locations of all fire alarms in their area.

4.1.2.5 *Escape*

During safety training and subsequent task leader/fire warden briefings, all SAIC Team employees will be informed of their building floor plan and exit routes. No one should use elevators when trying to escape from a fire. Fire safety personnel must be strictly obeyed during a fire evacuation. Our employees will keep all pathways and emergency exits free and clear of equipment and obstacles that would impede egress. Our employees also will be advised of to report to designated meeting place in the case of a major emergency. A list of these meeting places and the people who should report to them will be adopted from the GSFC building specific or off-site building specific evacuation plan to be appended and maintained in this Safety and Health Plan.

4.1.2.6 *Procedure for Handling Electric and Electronic Equipment Hazards*

Electrical equipment presents an electrical as well as a fire hazard. The SAIC Team will train employees to observe the following precautions:

- Equipment will be properly grounded, and electrical cables and wiring will be properly installed and maintained.
- Only trained personnel will be authorized to perform hazardous installation or maintenance of electronic equipment.
- Most project employees will use typical office electronic equipment and will not perform more than simple maintenance (e.g., clearing paper jams) on this equipment.

- The appropriate government personnel will be contacted if potentially hazardous procedures are required on site. The appropriate facilities maintenance personnel will be contracted if potentially hazardous procedures are required off site.

Some SAIC Team employees may be responsible for maintaining electronic systems, including computer systems. However, this responsibility generally will not include repair or installation of hazardous electronic equipment. Rather, the responsibility will be confined to typical installation of boards or components. We will train appropriate personnel to take lock out/tag out (LO/TO) precautions when performing such operations, including turning off and unplugging the equipment before beginning work and using electrostatic discharge (ESD) prevention measures documented in maintenance procedures. We will contact the appropriate NASA or local contracted service personnel if potentially hazardous work, such as diagnosing or repairing powered equipment, is required on or off site.

4.1.3 Protective Equipment

No special protective equipment is required for SAIC Team employees to operate office machinery at the site. However, future NASA acquisition of such devices will require revisions to this section of the Safety and Health Plan.

4.1.4 Hazardous Operations Permits

We do not anticipate any hazardous operations to be performed at the site that would require permits. Any future NASA requirements for obtaining hazardous operations permits will be discussed in this section of future revisions to the Safety and Health Plan. In the course of performing this contract, if NASA requires the SAIC Team to perform hazardous operations, we will research the appropriate NASA written hazardous operating procedures and/or qualification standards for personnel involved in hazardous operations. Upon completion of our findings, the SAIC Team will seek approval of GSFC's Safety and Environmental Branch to initiate any such operation and will seek NASA concurrence to implement appropriate safety measures prior to commencement of such operation. The GSFC permit system would be implemented.

4.1.4.1 Operations Involving Exposure to Toxic or Unhealthy Materials

SAIC expects NASA to identify any existing asbestos hazards in areas where SAIC Team employ-

ees will work on site. As part of the initial sites survey, as defined in Section 2.3, the SAIC Team GMAO S&H Committee will identify any operations that expose our employees to toxic or unhealthy materials for the duration of this contract. We will resolve such conditions using procedures defined in Section 2 of this plan. As always when performing tasks on site at a NASA facility, our S&H Committee will work with the center's safety officials to ensure that the relevant building or facility regulations are met at all times and that NASA's Occupational Health Office officials are notified prior to initiation of any operation potentially hazardous to health and are always informed of and included in decisions involving toxic or unhealthy materials. For off-site facilities, our S&H Committee will work with the local building or facility management as well as SAIC corporate EC&HS representatives prior to initiation of any operation potentially hazardous to health, and we will always inform them of and include them in decisions involving toxic or unhealthy materials.

GSFC's Safety and Environmental Branch will be notified prior to initiation of operations identified during the initial sites survey that involve exposure to toxic or unhealthy materials or of a new operation introduced by the SAIC Team to comply with performance of this contract. The SAIC Team will ask the Safety and Environmental Branch for concurrence to implement appropriate safety measures prior to commencement of such operation. During performance of this contract, where SAIC is the procurement source, we will substitute nonhazardous or less hazardous materials whenever possible.

Authorized NASA representatives will have access to and the right to examine sites or areas where work under this contract is being performed to determine the adequacy of our S&H measures.

4.1.4.2 Operations Involving Hazardous Waste

As part of the initial sites survey, defined in Section 2.2, the SAIC Team GMAO S&H Committee will identify operations that involve hazardous waste or discharges to the environment for the course of performance of this contract. Such conditions will be resolved using procedures defined in Section 2 of this plan. The SAIC Team will rely on NASA to identify asbestos exposure hazards within NASA facilities used by SAIC Team employees. As always when performing tasks at a NASA facility, our S&H Committee will work with the center's safety officials to

ensure that the specific building or facility regulations are met at all times and that NASA's Occupational Health Office officials are notified prior to initiation by the SAIC Team of any operation potentially hazardous to health and are always informed of and included in decisions involving hazardous waste. Similarly, the committee will work with SAIC corporate EC&HS officials for any off-site facility.

If operations are identified during the initial site survey that produce hazardous waste or if a new operation is to be introduced by the SAIC Team on site to comply with performance of this contract, SAIC will notify GSFC's Safety and Environmental Branch prior to initiation of hazardous waste operation on site, and GSFC hazardous waste disposal will be coordinated. Or, if not available, we will provide GSFC with a copy of waste removal agreements and proof of destruction.

4.2 Facility Baseline Documentation

The SAIC Team will update GSFC baseline facility documentation resulting from any task-order-directed-work or any NASA-directed changes to current work procedures. SAIC will forward these updates of the baseline documents to the COTR and the appropriate NASA facility official. As part of our self-inspection program (see Section 2.2), any affected work areas will be examined for new hazards and reported with possible corrective or mitigative action to NASA on a routine basis. For any off-site facility the report will be communicated to the SAIC facility representative and appropriate facility maintenance official.

4.3 Preventive Maintenance

On-site NASA is responsible for all maintenance of the facility and equipment therein and will ensure that such work is performed either by GSFC personnel or by the equipment vendor (in the case of office support equipment such as copy machines). The SAIC Team's GMAO personnel will not be trained in or permitted to perform maintenance of this equipment. The SAIC Team will coordinate with GSFC any issues pertaining to preventive maintenance. Contracts between GSFC and equipment vendors

will ensure that all maintenance necessary for safe operation is performed regularly. The SAIC Team will coordinate off-site maintenance with the appropriate subcontracted vendor.

4.4 Medical Program

SAIC Team employees will be advised as to the location of the NASA-provided first aid cabinet in each facility as well as location of the GSFC on-site health unit(s). The SAIC Team GMAO program manager will log all reports by SAIC Team employees of any illness they believe they have contracted while at the site, giving special attention to those that appear to derive from "sick building syndrome" (phenomenon deriving from recirculated air in modern sealed structures), airborne particulates or gases, or other factors in the office environment. For off-site facilities, SAIC will provide first aid kits to our employees.

We will encourage SAIC Team employees with contagious conditions to take leave. We will maintain employee medical information in a secure and confidential manner and provide access to only authorized personnel. We will be careful not to draw attention to or embarrass such individuals while still taking sufficient measures to maintain the health of other workers.

Our employees will be encouraged, but not required, to take part in freely available inoculations or other programs offered by the on-site health units for all center employees for such conditions as the flu, when these illnesses are prevalent. The SAIC DSO will arrange medical evaluations required for contract operations not available through the GSFC health unit (i.e., respirator physicals and fit tests, laser eye exams, hearing baseline test, lead testing, etc.) using off-site agencies.

We will search our collected illness data for trends that would indicate health issues associated with the workplace. For trends that are identified, we will issue reports to the appropriate NASA officials, and the SAIC Team will jointly develop resolutions with NASA, with NASA having final approval authority.

5. EMERGENCY RESPONSE

5.1 Emergency Preparedness

Appendix D, Emergency Action Plan, details the SAIC Team's emergency/contingency planning and preparedness activities. Upon receipt of a SAIC Team GMAO employee report of mishap, injury, or illness, the SAIC Team GMAO program manager will notify the COTR of the occurrence. SAIC Team employees will comply with GSFC emergency procedures and will participate in all site-sponsored drills to demonstrate emergency readiness and compliance with all site-related safety measures. Once the on-site area is secure, the program manager or group lead will ensure it remains so until GSFC Safety and Environmental Branch personnel arrive. Only the contracting officer and/or GSFC Safety and Environmental Branch personnel may release an area from its secure status. Off-site SAIC employees will comply with SAIC EC&HS emergency procedures and requirements found in SAIC's intranet.

All SAIC Team employees will be trained that emergency, fire, medical, safety, and security assistance can be summoned by dialing 911 at GSFC on the local telephone system. Emergencies are defined as follows:

- Incidents involving serious personal injury
- Incidents resulting in damage that causes a possible hazardous condition
- Incidents that require immediate attention of the GSFC's Safety and Environmental Branch or commercial building's engineering department or security.

All SAIC Team employees will be responsible for reporting medical treatment and will receive instructions for reporting on-the-job injuries. When snow emergencies occur in the Washington metropolitan area, we encourage our employees to take leave if they feel that attempting to report may be

hazardous. We will offer liberal leave, which our employees may use without prior notification, when major winter storms are forecast.

SAIC Fatality or Serious Injury/Illness Reporting

Immediately upon receiving notice of a fatality or serious injury or illness affecting an SAIC employee, temporary employee, or payrollee during a work-related activity, SAIC personnel must report the event to one of the following Corporate EC&HS personnel:

Gary Waggoner 858-826-4355 (office); 858-354-4468 (cell)
Jim Price 858-826-4359 (office); 858-967-2731 (cell)
Kurt Schmidt 858-826-3686 (office); 858-967-2733
Chris Sweet 703-676-6515 (office); 703-929-5350

SAIC Team employees will comply with and participate in the appropriate NASA Center's established procedures for emergency preparedness drills and evacuations. Off-site employees will comply with their task manager's, task leader's, or facility safety representative's instructions.

5.2 Fire Prevention

Appendix C, Emergency Action Plan, details the SAIC Team's fire safety rules.

SAIC Team GMAO employees have been instructed to report a fire or to pull the fire alarm and not attempt to extinguish a fire unless they have been trained to do so (i.e., fire warden fire extinguisher training).

5.3 CPR/AED, First Aid

All SAIC Team employees will be encouraged to voluntarily complete CPR, automated external defibrillator (AED), and first aid training. This will benefit the safety of our employees, both on and off the job.

6. SAFETY AND HEALTH AWARENESS AND TRAINING

6.1 Training

The SAIC Team will provide an orientation session to all SAIC Team employees that will include SAIC's safety policy, an orientation to this S&H Plan, identification of work site hazards (primarily office), hazard communication, and the location of first aid station(s), exits, alarms, and fire protection equipment. The SAIC Team will provide each employee with an overview of general, acceptable safety procedures, as well as hazards or safety procedures specific to that employee's work situation. The SAIC Team GMAO program manager will have the primary responsibility for identifying the content of the SAIC Team GMAO training program.

All employees involved in lifting heavy objects or using computer workstations will attend training sessions on proper lifting procedures and office ergonomics. We will place posters and other awareness materials in the workplace to illustrate proper lifting techniques as well as other on- and off-the-job safety topics. The SAIC Team program manager will be responsible for all required S&H training of SAIC Team GMAO group leads and employees and for ensuring required training of SAIC subcontractors. The SAIC DSO and/or the SAIC Team GMAO S&H Committee can document a requirement for additional training at any time.

6.1.1 Purpose of a Hazard Communication Program

A hazard communication program provides our employees with the knowledge and training necessary to understand and protect themselves and others from chemicals and to comply with the OSHA Hazard Communication Standard (1910.1200). SAIC Team training will be designed to instruct each SAIC Team GMAO employee on general safety procedures as well as safety procedures specific to that employee's GMAO-related job.

6.1.2 When Training Will Occur

- Upon hiring
- When the SAIC Team GMAO management believes additional training is warranted
- When an SAIC Team employee is given a new job assignment
- When new substances, equipment, or procedures that represent a new hazard are introduced by NASA or the SAIC Team

- When the SAIC Team is made aware of a new hazard
- When recertification training is required
- In response to trends in inspection results, close calls, mishaps, or management observations.

6.1.3 Training Topics

Our SAIC Team employee training will consist of new employee orientation, periodic group meetings, and one-on-one training. The SAIC Team GMAO S&H training provided to employees will include:

- Office safety
- First aid/CPR
- SAIC Team GMAO S&H Policy
- SAIC Team GMAO S&H Program
- Incident reporting
- Hazard communication
- Emergency procedures
- Office ergonomics
- Housekeeping
- Job-specific hazards
- GSFC hazard communication.

6.1.4 Training Documentation

The SAIC Team GMAO program manager (see Section 1.3.1) and SAIC DSO (see Section 1.5.4) will document employee training using the safety training form and will retain it on file and in the Web-based information system. The SAIC Team will identify and track recurrent training for certification requirements to ensure completion before the certification expires.

6.1.5 Communicating with Employees on Safety and Health Issues

Communication with our employees regarding health and safety issues must be two-ways, consisting of both employer-to-employee and employee-to-employer communications. We will train our employees through the formal SAIC S&H Program, new employee orientation, and specific training for new or current job assignments or hazards.

6.1.6 Reporting of Safety and Health Hazards

The SAIC Team has a system for our GMAO-assigned employee to report a hazard or unsafe condition. We will use the safety suggestion form to report and document such hazards. Each employee also should notify his or her immediate supervisor verbally of such a hazard or condition. The employee can report anonymously to maintain a reprimand.



sal-free employee environment. The employee can download the form from Web-based information. The employee will send the safety suggestion form to his or her SAIC Team task leader or, when anonymous, to the SAIC Team GMAO program manager and the SAIC DSO. We will conduct a prompt and thorough investigation of the situation.

6.1.7 Postings

As a routine part of the SAIC Team GMAO S&H Program, jurisdictional state or federal law may require postings (for example, S&H protection on the job, state OSHA citations and responses, and annual posting of the appropriate OSHA 300 forms), which we will prominently display in employee areas.

6.2 Certification

The SAIC Team will provide certification and recertification training where appropriate to ensure

our employees are qualified to perform their tasks through specific training, experience, or both.

6.3 Training Documentation and Verification

The SAIC Team will document safety and safety-related training in accordance with OSHA requirements. During the quarterly inspection, the SAIC Team GMAO S&H committee will assess whether employees are retaining and practicing training by observing employee compliance with the SAIC Team and NASA GMAO-related S&H policy and procedures. The committee may recommend additional training where warranted. Upon request, the SAIC Team will provide all training materials and training records to GSFC's Safety and Environmental Branch for review.

SAIC Team GMAO Employee Safety Training Form

Employee Name: _____ Hire Date: _____
Position: _____ Trainer: _____

I acknowledge that I have been briefed on the safety and health areas checked below and agree to follow all SAIC Team GMAO safety and health rules, policies, and procedures.

_____ S&H Program

- My right to ask questions or report any safety hazards, either directly or anonymously, without any fear of reprisal
- The location of SAIC safety bulletins and required safety postings (i.e., summary of occupational injuries and illnesses and S&H protection poster)
- Disciplinary procedures that may be used to ensure compliance with safe work practices
- Reporting safety concerns
- Accessing the department safety committee.

_____ Incident Reporting and Reporting Occupational Injuries and Illnesses

_____ Hazard Communication

- The potential occupational hazards in the work area associated with my job assignment
- The safe work practices and personal protective equipment required for my job
- The location and availability of Material Safety Data Sheets (MSDS)
- The hazards of any chemicals to which I may be exposed and my right to the information contained on MSDSs for those Chemicals.

_____ The SAIC Team GMAO S&H Plan (and have been provided access to a copy)

_____ Emergency Procedures

_____ Other: _____

- My rights under the OSHA and Workers' Compensation Law.

I understand the above items and agree to comply with safe work practices in my work area.

Employee Signature _____
Date

I have briefed the above employee in the categories indicated on this form.

Signature _____
Date

7. SPECIALIZED PROGRAMS

7.1 General Housekeeping

GMAO maintains a general office environment within its facilities. NASA and the SAIC Team both recognize that housekeeping is a key element in maintaining a safe and healthy work environment. Section 4.1.2.1 outlines the procedures for general hazard avoidance.

7.2 Lock Out/Tag Out

OSHA requires that all affected employees receive LO/TO training. NASA has exclusive control over access to all mechanical space within all areas where GMAO work will be performed on site; authorized facilities maintenance officials control off-site access. The SAIC Team's GMAO employees do not have access to any areas within those facilities where LO/TO procedures would take place. No SAIC Team's GMAO employees have prior authority to invalidate the integrity of any LO/TO system or any other safety system.

Accordingly, the SAIC Team's GMAO personnel are not affected employees as that term relates to facilities' LO/TO procedures. For electrical equipment maintained or accessed under the tasks of this con-

tract, we will perform an assessment to identify the potential hazards will document and proper maintenance procedures, including LO/TO provisions. We will train employees annually in these procedures. Most equipment probably will require simple unplugging to accomplish energy control, but we will assess the potential for stored energy (i.e., batteries and capacitors). We will complete an annual program review and training according to OSHA requirements.

7.3 Office Ergonomics

We will give all SAIC Team employees assigned an office workstation office ergonomics training, which will provide our employees with the knowledge to identify and avoid ergonomic stress before they incur pain or injuries. This training will include workstation set-up and general preventative measures. The DSO proactively will perform or arrange for ergonomic assessments of employees at their workstations and in response to employee-identified issues, with a goal of 100% employee assessment.

8. REFERENCES

- Public Law 91-596, Occupational Safety and Health Act of 1970
- Title 29 Code of Federal Regulations Part 1904
- Title 29 Code of Federal Regulations Part 1910
- Title 29 Code of Federal Regulations Part 1910.1200, Hazard Communication
- Title 29 Code of Federal Regulations Part 1926
- Title 29 Code of Federal Regulations Part 1960
- Federal STD 313, Material Safety Data Sheets
- OSHA Publication 3088, How to Prepare for Worksite Emergencies
- OSHA Hazard Communication Standard (1910.1200)
- Engineer Manual 385-1-1, U.S. Army Corps of Engineers, Safety and Health Requirements
- NFS 1852.223-73 Safety and Health Plan
- NPR 8621.1A, NASA Mishap Reporting and Investigating Policy
- NPD 8710.1, Emergency Preparedness Program
- NPD 8710.2, NASA Safety and Health Program Policy
- NPG 5100.4, NASA Federal Acquisition Regulation Supplement
- NPR 8715.1, NASA Safety and Health Handbook—Occupational Safety and Health Programs with Change 2 (03/30/04)
- NPG 8715.2, NASA Emergency Preparedness Program Plan
- NPR 8715.3 NASA Safety Manual with Change 2 (03/30/04)
- NASA-STD-8719.11, NASA Safety Standard for Fire Protection
- GSFC GMI 1040.5, GSFC Emergency Management Program
- GSFC GMI 1040.6, GSFC Emergency Management Plan
- GSFC GMI 1152.9, Facilities Coordination Committee
- GSFC GHB 1600.1, Security Manual
- GSFC GMI 1700.2, GSFC Safety and Health Program
- GSFC GMI 1772.1, Center Smoking Policy
- GSFC GMI 1780.1, GSFC Confined Space Policy
- GSFC GHB 1790.1, Chemical Hygiene Plan
- GSFC GHB 8800.2, GSFC Environmental Handbook

APPENDIX A: APPROACH TO ACHIEVING AND MAINTAINING PEP LEVEL 5

PEP Element	Status	Supporting Rationale	Plan to Achieve a Level 5
Management Leadership and Employee Participation			
Management Leadership	4	SAIC management will communicate a clearly stated safety policy that is consistent with GSFC philosophy and policy. We will make a commitment to provide a safe workplace by conducting site inspections, incident reviews, and program reviews. Line management is responsible for implementing proactive safety performance objectives as part of annual evaluations. We will establish a S&H committee, including employee and management representation, in other NASA programs and form one for the GMAO contract. We will provide adequate support and resources to conduct occupational S&H activities. <i>Applicable Safety and Health Plan Section: 1.0</i>	To achieve a Level 5 rating, the SAIC Team will document management leadership activities such as assigning responsibility for S&H, ensuring accountability in line management performance plans, establishing contract S&H goals, including safety as an agenda item at regular meetings, and performing an annual assessment of the S&H program. These activities will take place during the first 12 months of the contract.
Employee Participation	4	Employees will have a wealth of resources and knowledge to participate in S&H activities based on the variety and volume of health-related activities we perform under the GMAO contract. We will document these in the S&H Plan and make them readily accessible. We also will inform employees of their stop work rights. <i>Applicable Safety and Health Plan Section: 1.4</i>	To achieve a Level 5 rating, the SAIC Team will document all employee involvement activities such as participation in safety training, workplace inspections, and reporting procedures for adverse S&H conditions. We also will ensure that employees understand their OSHA rights and their right to stop work. We will select and train employees to participate in audits, program reviews, and to serve as GMAO safety representatives on the S&H committee. In the initial months of the contract we will establish committees, develop audit schedules, and train employees. These activities will take place during the first 12 months of the contract.
Implementation Tools	4	We will provide adequate budget and personnel resources for the S&H program. We will establish written safety procedures and policies in this S&H Plan and update them according to changes in processes, tasks, and/or applicable requirements and regulations. We will provide online access to the S&H Plan through our Web-based information system for access to all SAIC Team employees. Management, using the Web-based information system, will keep all records for at least 3 years, or longer if required by regulation. <i>Applicable Safety and Health Plan Sections: 1.5.6, 1.9, and Appendix B</i>	We will implement and effectively use all tools identified in this plan and related resources, such as the Web-based information system. We will continually examine these tools and modify them as necessary to improve their effectiveness and examine and adapt new tools that apply to the GMAO mission. We will document all these resources, including funding, personnel, accountability systems, and program reviews. We will explore the utility of publishing a safety handbook guide for our team members. These activities will be completed within the first 12 months of the contract.
Management Leadership and Employee Participation (continued)			
Contractor Safety	4	Our contractor team member has an excellent S&H record. We will use our contractors' safety performance as a selection criteria, such as OSHA 300 logs, workers' compensation experience modifiers, OSHA violations, and the existing safety program as evaluation tools. We expect all contractors to operate safely. <i>Applicable Safety and Health Plan Section: 1.7</i>	We require all contractors to meet all relevant S&H standards and requirements, including the requirement to participate in existing S&H activities in the teaming agreements. We will continuously evaluate the S&H performance of our contractors and will include safety as a technical management review item. These activities will take place during the first 12 months of the contract.

PEP Element	Status	Supporting Rationale	Plan to Achieve a Level 5
Workplace Analysis			
Survey and Hazard Analysis	4	The SAIC Team is committed to conducting job safety analyses and inspections for complete coverage of contract operations. Other SAIC Teams currently perform these activities, along with quarterly safety inspections of all company workspaces, and track all items to closure using an audit tracking system, our Web-based information system. When required, we will track them through GSFC systems. We encourage employees to identify hazards in the workplace. <i>Applicable Safety and Health Plan Section: 2.0</i>	To achieve a Level 5 rating, the SAIC Team will effectively implement and document the survey and hazard analysis process to support GSFC and contract initiatives. We will perform and document a job safety analysis of all processes and work practices. We will involve certified S&H professionals to conduct baseline facility surveys, PEP assessments, industrial health surveys, etc., of contract spaces. We will document findings and take corrective action in a timely manner. Management will be accountable for such actions. Surveys will be conducted within the initial months of the contract and all activities will be completed within the first 12 months of the contract.
Inspection	3*	All activities listed above in "Survey" apply. Certified safety professionals and trained employee representatives will inspect all contract spaces quarterly. We will use standard checklists and audit forms to document key findings and observations. <i>Applicable Safety and Health Plan Section: 2.2</i> <i>* Highest rating possible prior to contract phase-in.</i>	To achieve a Level 5 rating, we will establish inspection schedules and begin inspections in the initial months of the contract. We will select and train employee representatives to participate in audits and inspections. We will document findings and corrective actions for initial inspections and make them available to employees and management. We will analyze results and identify trends for management review and action and identify focus areas for continuing improvement. All activities will take place within the first 12 months of the contract.
Mishap and Record Analysis			
Mishap Investigation	3*	We have established procedures within this S&H Plan to investigate all OSHA recordables, first aid, and NASA type A, B, and C mishaps. Other SAIC programs currently investigate all incidents, identify root causes, and develop action plans to prevent recurrence. We will present this information, along with close call and hazard reports, to the employee safety committees, who will make it available to all employees. Managers and area functional leads are responsible for conducting investigations, which will be reviewed by qualified S&H professionals. <i>Applicable S&H Plan Section: 3.0</i> <i>* Highest rating possible prior to contract phase-in.</i>	To achieve a Level 5 rating, the SAIC Team will fully implement applicable plan procedures and ensure that all incidents, whether near-miss or lost-time, are thoroughly investigated and reported according to GSFC, NASA, and OSHA requirements. We will track injury and close-call trends using processes proposed in this plan and used in other company divisions. These procedures will become effective immediately upon contract initiation. Monitoring of the investigation process will take place during the first 12 months of the contract.
Data Analysis	3*	Contract management is accountable for S&H and is, therefore, interested and responsive to data resulting from injury and close calls. Line management will communicate audit findings, mishap trends, and other S&H information directly to employees and also will make it available through the Web-based information system. We will use databases established for tracking audit findings to identify potential mishap sources and track identified safety deficiencies to closure. <i>Applicable S&H Plan Section: 3.2</i> <i>* Highest rating possible prior to contract phase-in.</i>	To achieve a Level 5 rating, we will document all mishap statistics and provide them to NASA monthly. We will analyze this data to generate meaningful reports that can be used to improve S&H and reduce potential workplace hazards. We will analyze and communicate them to management and employees quarterly and to NASA upon request or as contractually required. We also will trend audit findings to measure program effectiveness and develop action plans to eliminate hazardous conditions. We will identify and evaluate all hazardous operations and exposures. These activities will be ongoing during the first 12 months of the contract.

PEP Element	Status	Supporting Rationale	Plan to Achieve a Level 5
S&H Training	3*	<p>The SAIC Team has an effective S&H training program in place at NASA Headquarters, one that has repeatedly passed government performance audit, and we will implement a similar plan on the GMAO contract. We will use certified S&H professionals with appropriate expertise to provide employee safety training. Training will include procedures to report injuries and notify management of hazards, OSHA standards, and employee rights under OSHA. We will document S&H training, including safety training, in the online training information system in our SAIC Web-based information system. Currently, management is responsible for establishing training plans consistent with employee job tasks.</p> <p><i>Applicable Safety and Health Plan Section: 1.0</i></p> <p><i>* Highest rating possible prior to contract phase-in.</i></p>	<p>To achieve a Level 5 rating, we will implement for GMAO employees successful training and tracking systems that we currently use in our other SAIC divisions. New employee training will include S&H and it will be documented. Training will be conducted by S&H professionals with specific experience in areas such as lock out and tag out, fire safety, hazard communication, emergency response, and other components relevant to the GMAO mission. Management will develop training plans that specifically address each employees' needs as appropriate based upon job tasks and job hazards. These activities will take place and be developed further during the first 2 months of the contract.</p>

APPENDIX B: SAIC HAZARD ASSESSMENT FOR LOCAL OFFICE

Environmental Compliance and Health and Safety Questionnaire

Date:

Location No. #

Division Number

Group Number

Task Manager(s)

Completed By:

I. Does your location:

Yes

No

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | a. Use or store hazardous chemicals or hazardous substances (e.g., materials with an MSDS)? |
| <input type="checkbox"/> | <input type="checkbox"/> | b. Generate or dispose of hazardous waste? |
| <input type="checkbox"/> | <input type="checkbox"/> | c. Use or transfer radioactive materials or devices that contain sources of radioactivity? |
| <input type="checkbox"/> | <input type="checkbox"/> | d. Use lasers? |
| <input type="checkbox"/> | <input type="checkbox"/> | e. Use shop tools, equipment, or machines? |
| <input type="checkbox"/> | <input type="checkbox"/> | f. Operate powered industrial trucks (e.g., forklifts, motorized hand trucks, etc.)? |
| <input type="checkbox"/> | <input type="checkbox"/> | g. Operate motor vehicles as a principal part of their employment? |

2. Are SAIC employees under your supervision involved in:

Yes

No

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | a. On-site work at nuclear facilities? |
| <input type="checkbox"/> | <input type="checkbox"/> | b. On-site work at environmental remediation sites? |
| <input type="checkbox"/> | <input type="checkbox"/> | c. Emergency response activities for hazardous substances or hazardous chemicals? |
| <input type="checkbox"/> | <input type="checkbox"/> | d. Asbestos related activities? |
| <input type="checkbox"/> | <input type="checkbox"/> | e. Work involving exposure to hazardous substances or radiation? |
| <input type="checkbox"/> | <input type="checkbox"/> | f. Work involving exposure to airborne contaminants or use respirators and SCBA? |
| <input type="checkbox"/> | <input type="checkbox"/> | g. Entering confined spaces for any reason? |
| <input type="checkbox"/> | <input type="checkbox"/> | h. Diving operations? |
| <input type="checkbox"/> | <input type="checkbox"/> | i. Work with exposure to hazardous energy sources (e.g., electrical, hydraulic)? |
| <input type="checkbox"/> | <input type="checkbox"/> | j. Laboratory work? |
| <input type="checkbox"/> | <input type="checkbox"/> | k. Work for which protection must be worn for eyes, face, head, feet, hands, or ears? |
| <input type="checkbox"/> | <input type="checkbox"/> | l. Activities involving task management or receipt of hazardous materials (e.g., paints, solvents, aerosols, preservatives, etc)? |

3. Does your location have:

Yes

No

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | a. An EPA hazardous waste generator identification number? |
| <input type="checkbox"/> | <input type="checkbox"/> | b. Any air discharge permits (e.g., spray paint booths, vapor degreasers)? |
| <input type="checkbox"/> | <input type="checkbox"/> | c. Any water discharge permits (e.g., industrial waste)? |
| <input type="checkbox"/> | <input type="checkbox"/> | d. A radioactive materials license from a state or the U.S. Nuclear Regulatory Commission? |

Are there other environmental, health or safety exposures associated with your division's work activities not covered by any of the above questions?

4. If you gave an affirmative answer to any of the above questions, please indicate: 1) whether an environmental compliance and H&S program has been implemented to control the identified risks; and 2) who has been assigned to implement the program. In accordance with SAIC's EC&HS Policy Statement, each location is required to have a local EC&HS official who is responsible for developing and implementing an EC&HS program that satisfies the requirements outlined in the corporate EC&HS program. Please identify below the individual(s) assigned this responsibility for each location(s) covered in your responses to this questionnaire.

Yes No

5. Does your location have a Corporate EC&HS Manual?

Comments:

Return completed form to:

Gary Waggoner
4224 Campus Point Drive
MS B-2 Loc. 291
San Diego, CA 92121

APPENDIX C: EMERGENCY ACTION PLAN

General. Employees should immediately report all fires, medical emergencies, and bomb threats to their group leads or the DSO and the local emergency services: Dial—911.

The building evacuation will be signaled by voice command, fire alarm, or public address system. Employees may not reenter the building until an “all clear” signal is received. For on-site locations, only the contracting officer and/or GSFC Safety and Environmental Branch personnel may give the all clear signal. Off-site, the DSO, task manager, task leader, or facility safety representative will signal all clear by voice command.

Employees will evacuate from the immediate area in which a fire or medical emergency has taken place and from adjacent areas that may be endangered by the occurrence. Group leads will report head counts to the program manager to ensure 100% accountability.

When an incident is so severe that it may endanger a major portion of the building or involve the entire building, the entire facility will be evacuated.

The DSO will create a staff recall roster to ensure that all staff members, including subcontractor team members, are accounted for in an evacuation or emergency. The DSO also will use the recall roster to notify all staff members of an upcoming event or drill. The roster will highlight key safety or management staff. It is the DSO’s responsibility to keep the roster current. Recall authority rests only with the task manager.

Responsibilities

- A. Program manager and group leads will:
1. Conduct employee training as described in section Employee Education and Drills. Record training events, with the names of employees trained, date, type/purpose of training, and name of task leader and trainer.
 2. In the event of an emergency, order the evacuation of employees.
 3. Account for employees and report results to local emergency service agencies.
- B. Designated Safety Official
1. Complete the required information on the Emergency Quick Reference forms and distribute to employees and team members.

Sample Emergency Quick Reference Form. The information cited here is a quick reference emergency action form. The SAIC Team DSO will tailor the form to the specific site he or she is responsible for and will distribute the form to each employee. Here is a sample form:

2. Construct an emergency escape diagram for each SAIC occupied building titled, Evacuation Routes and Meeting Areas, showing evacuation routes, emergency equipment, and a designated meeting area in case of building evacuation.
3. Ensure that all employees have been trained in emergency procedures, complete an annual drill, and document the training. Drills may include basic evacuation, shelter in place, severe weather response, or security event. Record training events at least with the names of employees trained, date, type and purpose of training, and name of responsible task leader and trainer.

C. Employees

1. Report emergencies promptly.
2. Stay out of an area that has been evacuated until an “all clear” has been given in accordance with the general section of this evacuation procedure.

Emergency Reporting

- A. In the event of a fire or medical emergency, dial: 911, and follow these directions.
1. State your name and exact location of emergency.
 2. State the nature of the emergency (e.g., fire).
 3. Stay on the line unless an immediate evacuation is necessary.
- B. If necessary, evacuate an injured individual to the health center for professional first aid care.

Evacuation Procedure

- A. When an S&H official gives instructions to evacuate the area or building, employees will:
1. Shut down equipment that, if allowed to run, may create a hazard or cause damage if left unattended;
 2. Close all doors to work areas;

In Case Of Emergency	
Emergency Telephone	Dial "911" or _____ (insert telephone number).
Fire	1. Evacuate immediate area. 2. Dial emergency number. 3. Attempt to control fire if safe to do so.
Medical	1. Do not move victim (except for safety reasons). 2. Dial emergency number.
Hazardous Material Event	1. Evacuate immediate area. 2. Dial emergency number. 3. Contact the local safety officer at (insert telephone number).
EVACUATION SIGNAL: (identify signal, such as voice, fire alarm, or broadcast over public address system)	

3. Exit the building in an orderly manner by the nearest and safest evacuation route and meet at the designated meeting area. Follow the posted Evacuation Routes and Meeting Areas, for evacuation routes and designated meeting area(s):

Fire wardens will post a building diagram indicating evacuation routes and meeting areas is posted throughout the building. Fire wardens will assist supervisors to ensure employees are aware of building emergency procedures, routes, location of emergency equipment (fire extinguishers, alarm pull box, etc.) and the designated meeting area for evacuation accountability.

4. Remain in the meeting area until an S&H official signals "all clear" or a management decision is made to leave the area.

Fire

- A. An employee who discovers a fire will report or direct another employee to report the fire and its exact location to emergency services by dialing 911.
- B. Only trained employees (i.e. fire wardens) in the vicinity of a fire may attempt to extinguish the fire with available extinguishers, and only if it can be done safely when, or after, the emergency services have been notified.
- C. All other employees must leave the area by the nearest and safest evacuation route in an orderly manner and gather at the designated meeting area.

Bomb Threat

- A. An employee should take the following actions in response to a bomb threat:
 1. Obtain as much of the following information as possible:
 - a. Location of bomb (building, area, room, and other details)
 - b. Time bomb is set to go off
 - c. What it looks like (whether it is concealed or in the open)
 - d. How it got into the office.
 2. Attempt to identify the caller's gender, knowledge of the building, and accent
 3. Attempt to identify background noise
 4. Notify the program manager or your group lead when the call ends. Do not talk to anyone else about the call except as instructed by your supervisor or CM.
- B. The program manager or group lead, working in conjunction with local authorities, will determine whether to evacuate the building.

Employee Education and Drills

- A. The task leader is responsible for training employees in emergency procedures. The DSO will coordinate the training for the SAIC GMAO Team and will assist the group leads. The group lead will possess a thorough understanding of reporting, actions, and evacuation procedures to avoid confusion during an actual emergency.
- B. SAIC, NASA, and subcontractors will train employees annually and new hires and temporaries at the time of initial assignment. Group leads will document the training.
- C. Annual employee training is documented which is kept in a training file with a copy forwarded to the DSO. New hires and temporary employees' training is documented on the EC&HS Orientation Acknowledgment or similar document, which is then kept in a training file, with a copy forwarded to the DSO.
- D. Training shall focus on:
 1. Immediate action to be taken in the event of a fire or medical emergency

2. Identification of equipment in a work area that is to be shut down in an emergency, if it can be done safely
3. Location of fire extinguishers and any other emergency equipment in the employees' work area, exits, gathering areas, and roll call procedures
4. The method by which employees will be notified of an emergency
5. Identification of evacuation routes and designated meeting area.

Hazardous Material Event

In the event of a spill or an activity resulting in the potential exposure of people directly or indirectly to hazardous material:

- A. Evacuate the immediate area and isolate it if possible
- B. Dial 911
- C. Contact the DSO (who will refer to SAIC's EC&HS Procedure 24, Regulatory Agency Inspections and Incident Reporting, and the SFAO safety office for additional requirements, as applicable.