

**U. S. DEPARTMENT OF ENERGY
OFFICE OF SCIENCE -- CHICAGO OFFICE**

**NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
ENVIRONMENTAL EVALUATION NOTIFICATION FORM**

To be completed by "Applicant," i.e., organization receiving funds and/or implementing Federal Actions as defined by 40 CFR § 1508.18. For assistance, refer to "Instructions for Preparing SC-CH F-560, Environmental Evaluation Notification Form."

Solicitation/Award No. (if applicable): DE-FOA-0000768

Organization Name: General Atomics

Title of Proposed Project/Research: DIII-D National Fusion Program Research and Facility Operations and Advanced Fusion Technology Resea

Total DOE Funding/Total Project Funding: \$367,274,830

I. Project Description (use explanation page if additional space is required):

A. Proposed Project/Action (if applicable, delineate Federally funded/Non-Federally funded portions)

This proposal is for a five-year extension (2014–2019) to the Cooperative Agreement "DIII-D National Fusion Program Research and Facility Operations and Advanced Fusion Technology Research and Development", DE-FC02-04ER54698, whose primary mission is to conduct operations in support of scientific research on the DIII-D tokamak. It is in response to the Department of Energy (DOE) opportunity announcement DE-FOA-0000768. The proposal involves General Atomics' (GA) leadership of research within the DIII-D National Fusion Program, operation of the DIII-D National Fusion Facility, research in Advanced Fusion Technology, and management of the U.S. Burning Plasma Organization (USBPO).

DIII-D operations and scientific research will be conducted in a similar manner to the last five year period of performance and involves fusion research on an existing experiment not using tritium as fuel. (continued in explanation section)

B. Would the project proceed without Federal funding? Yes No

If "yes," use explanation page.

II. Description of Affected Environment:

The research conducted as part of this proposal will be carried out in an existing dedicated building on the General Atomics Torrey Pines campus in San Diego, California. Approximately 75 staff supporting operation of the DIII-D facility work in, or in close proximity to, this building. Additionally, the scientific research staff (General Atomics and collaborating institutions), which number approximately 100, have office accommodations near the DIII-D facility.

DIII-D operations and scientific research will be conducted in a similar manner to the last five year period of performance and involves fusion research on an existing experiment not using tritium as fuel. As a private company operating in San Diego, GA conducts all activities in accordance with all city, county, state (CAL OSHA) and federal laws and regulations.

III. Preliminary Questions:

- | | | |
|---|--------------------------|-------------------------------------|
| | Yes | No |
| A. <u>Is the DOE-funded work routinely administrative or <i>entirely</i> advisory or a "paper study?"</u> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

If "Yes", ensure that the description in Section I reflects this and go directly to Section V.

- B. Is there any potential whatsoever for:

Provide an explanation for each "Yes" response.

- | | Yes | No |
|--|-------------------------------------|-------------------------------------|
| 1. Work to be performed outdoors? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Major modification of a building interior? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Threat of violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Siting, construction or major expansion of waste treatment, storage, or disposal facilities? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Disturbance to hazardous substances, pollutants, or contaminants preexisting in the environment? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. The presence of any environmentally-sensitive resources? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Potential for high consequence impacts to human health or the environment? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. The work being connected to another existing/proposed activity that could potentially create a significant impact? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. Nearby past, present, and/or reasonably foreseeable future actions such that collectively significant impacts could result? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Scientific or public controversy over whether impacts could be significant? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

If "No" to ALL Section III.B. questions, go directly to Section V.

IV. Potential Environmental Effects:

Provide an explanation for each "Yes" response.

- A. Sensitive Resources: Could the proposed action potentially result in changes and/or disturbances to any of the following resources?

- | | Yes | No |
|--|-------------------------------------|-------------------------------------|
| 1. Threatened/Endangered Species and/or Critical Habitats | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Other Protected Species (e.g., Burros, Migratory Birds) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Sensitive Environments (e.g., Tundra/Coral Reefs/Rain Forests) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Cultural or Historic Resources | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Important Farmland | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Non-Attainment Areas for Ambient Air Quality Standards | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Class I Air Quality Control Region | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Special Sources of Groundwater (e.g. Sole Source Aquifer) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. Navigable Air Space | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Coastal Zones | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 11. Areas with Special National Designation (e.g. National Forests, Parks, Trails) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12. Floodplains and/or Wetlands | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated Items or activities?

	Yes	No
13. Natural Resource Damage Assessments	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14. Invasive Species or Exotic Organisms	<input type="checkbox"/>	<input checked="" type="checkbox"/>
15. Noxious Weeds	<input type="checkbox"/>	<input checked="" type="checkbox"/>
16. Clearing or Excavation (indicate if greater than one acre)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
17. Dredge or Fill (under Clean Water Act, Section 404, greater than one acre)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
18. Noise (in excess of regulations)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
19. Asbestos Removal	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20. Polychlorinated biphenyls (PCBs)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
21. Import, Manufacture, or Processing of Toxic Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>
22. Chemical Storage/Use	<input checked="" type="checkbox"/>	<input type="checkbox"/>
23. Pesticide Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
24. Hazardous, Toxic, or Criteria Pollutant Air Emissions	<input type="checkbox"/>	<input checked="" type="checkbox"/>
25. Liquid Effluents	<input type="checkbox"/>	<input checked="" type="checkbox"/>
26. Spill Prevention/Surface Water Protection	<input checked="" type="checkbox"/>	<input type="checkbox"/>
27. Underground Injection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28. Hazardous Waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>
29. Underground Storage Tanks	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
30. Radioactive or Radioactive Mixed Waste	<input checked="" type="checkbox"/>	<input type="checkbox"/>
31. Radiation Exposure	<input checked="" type="checkbox"/>	<input type="checkbox"/>
32. Nanoscale Materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>
33. Genetically Engineered Microorganisms/Plants or Synthetic Biology?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
34. Ozone Depleting Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>
35. Greenhouse Gas Generation/Sustainability	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36. Off-Road Vehicles	<input type="checkbox"/>	<input checked="" type="checkbox"/>
37. Biosafety Level 3-4 Laboratory	<input type="checkbox"/>	<input checked="" type="checkbox"/>

C. Other Relevant Information: Would the proposed action involve the following?

	Yes	No
38. Existing, Modified, or New Federal/State Permits	<input checked="" type="checkbox"/>	<input type="checkbox"/>
39. Disproportionate Nearby Presence of Minority and/or Low Income Populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
40. Action/Involvement of Another Federal Agency (e.g. license/permit, funding, approval)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
41. Action of a State Agency in a State with NEPA-type law	<input type="checkbox"/>	<input checked="" type="checkbox"/>
42. Public Utilities/Services	<input checked="" type="checkbox"/>	<input type="checkbox"/>
43. Depletion of a Non-Renewable Resource	<input type="checkbox"/>	<input checked="" type="checkbox"/>
44. Other Pertinent Information Which Could Impact Human Health or the Environment	<input type="checkbox"/>	<input checked="" type="checkbox"/>

V. Applicant Certification that to the best of their knowledge all information provided on this form is accurate:

Does this disclosure contain classified, confidential, or other exempt information that DOE would not be obligated to disclose pursuant to the Freedom of Information Act? Yes No

A. Organization Official (Name and Title): Keith E. Asmussen, Director, Compliance

Signature: Keith E. Asmussen Date: 07/25/2014

e-mail: keith.asmussen@ga.com Phone: 858.455.2823

B. Optional Secondary Approval (Name and Title): _____

Signature: _____ Date: _____

e-mail: _____ Phone: _____

Remainder to be completed by DOE

VI. DOE Concurrence/Recommendation/Determination:

A. DOE Project Director/Program Manager or Contract/Grant Management Specialist:

Has the Applicant completed the Form correctly? Yes No
Does an existing Generic Categorical Exclusion apply? Yes No
If yes, indicate: B3.13 - Magnetic fusion experiments

Name and Title: Mark S. Foster, Program Manager, SC/Fusion Energy Sciences

Signature: [Signature] Date: 07/25/2014

B. DOE NEPA Team Review:

Is the class of action identified in the DOE NEPA Regulations (Appendices A-D to Subpart D (10 CFR § 1021))? Yes No
If yes, specify the class(es) of action: B3.6, B3.13

Name and Title: Peter R. Siebach

Signature: [Signature] Date: 8/1/2014

C. DOE Counsel (if requested):

Name and Title: _____

Signature: _____ Date: _____

D. DOE NEPA Compliance Officer:

The preceding pages are a record of documentation required under DOE Final NEPA Regulation, 10 CFR § 1021.400.

- Action may be categorically excluded from further NEPA review. I have determined that the proposed action meets the requirements for Categorical Exclusion referenced above.
- Action requires approval by Head of the Field Organization. Recommend preparation of an Environmental Assessment.
- Action requires approval by Head of the Field Organization or a Secretarial Officer. Recommend preparation of an Environmental Impact Statement.

Comments/limitations if any:

NEPA Compliance Officer:

Name: Peter R. Siebach

Signature: [Signature] Date: 8/1/2014

Optional Additional Narrative: (add additional detail to description to Sections I and II or explanations to responses in Sections III and IV.

I. A. (continued)

As a private company operating in San Diego, GA conducts all activities in accordance with all city, county, state (CAL OSHA) and federal laws and regulations. The proposed project utilizes the existing DIII-D National Fusion Facility located on the General Atomics Torrey Pines campus in San Diego, California, with an estimated replacement cost of approximately \$850M. The DIII-D Program encompasses approximately 115,000 SF of operations/laboratory space and 35,000 SF of office space for the scientific/engineering staff. The proposed research will make use of a facility provided by General Atomics, which will include a modest extension (1,600 square feet) to the existing building (approx 115,000 square feet) to accommodate new heating systems for DIII-D. There are no plans for new utility lines or for extension excavation in the proposal. The proposed action is all federally funded with the exception of the building extension which will be provided by General Atomics.

III. B. 1. Work to be performed outdoors?

Auxiliary equipment (Motor Generators, Power Supplies, Transformers, Cooling Towers) gas storage, materials and equipment are located in the yard surrounding the Tokamak and Diagnostic laboratory buildings. Maintenance performed on this equipment is done at the site of the equipment.

III.B.2. Major modification of a building interior?

Modification of the interior space of the Tokamak building is always a possibility should a rearrangement of equipment or major upgrade require it, however, based on the research and operations planned and upgrades proposed during this renewal period of performance, no major modifications of the building interior are anticipated.

IV. A. 10. Changes, disturbances to Coastal Zones?

General Atomics Torrey Pines site which houses the DIII-D National Fusion Facility is within the California Coastal Commission jurisdiction. Activities associated with the research and operation of the DIII-D Tokamak will have no impact on the Coastal zone. Proposed building expansion will require Coastal Commission approval.

IV. B. 22. Chemical storage/use?

Small quantities of the following chemicals listed in 29 CFR 1910.1000 table as listed below:

Approximate maximum storage at any given time:

Acetone – 5 gallons

Ethyl Alcohol 200 proof – 5 gallons

Isopropyl alcohol – 5 gallons

IV. B. 26. Spill prevention/surface water protection?

A Spill Prevention Control & Countermeasure Plan and an Oil Spill Contingency plan has been prepared in accordance with Part 112 and Part 109 of 40CFR 112. The Plan has been reviewed and certified as meeting the requirements of 40CFR112.

IV. B. 28. Hazardous Waste?

Hazardous waste is generated and collected per County of San Diego, DEH, Hazmat Permit. The waste is transported off site by a licensed transportation company specializing in chemical and radiologic waste. GA has a federal EPA ID #CA R000198143 for transportation of such waste. Waste generated is from general cleaning and tooling process pertaining to the fusion activities.

IV. B. 30. Radioactive or radioactive mixed waste?

Although tritium is not used as a fuel in the DIII-D experiment, small quantities of tritium are produced as a natural byproduct of the fusion of deuterium nuclei in DIII-D experiments. Radioactive mixed waste is thus generated from tritium contaminated vacuum pump oil. See above IV. B. 28 for details on handling and disposal. Tritium is also released to the environment as a gaseous effluent at a maximum rate of 0.7 Curies/year in the form of HTO, HT, DT, and DTO. See below (IV.B.31) for effective dose at the site boundary resulting from this release of Tritium.

IV. B. 31. Radiation exposure?

The major source of radiation derives from prompt neutron emission from the fusion reaction, xrays from high energy electrons, and gamma rays from decay of material made radioactive by the fusion neutrons. Additional radioactive sources are used for equipment calibration and include the following isotopes: Am-241, Fe-55, Cf-252, Sr-90, Co-60, Po-210, CS-137, and TI-204. Exposures from these additional sources is minimal compared to neutron and gamma dose rates. The facility adheres to pertinent State & Federal regulations and DOE guidance. The site ALARA plan calls for keeping both Public and Staff exposure levels to less than the limits set by State and Federal regulations. Site boundary limits are set by California regulations. A monitoring program has been established for both site boundary and staff exposure levels. Typical public site boundary doses are 5 - 10 mrem/quarter and always below our administrative limit of 15 mr/quarter. Employee dose rates are typically 100 mrem/quarter and always below the California limits of 5000 mrem/year and below our administrative limits of 1600 mr/year and 400 mrem/quarter.

For tritium release, calculations of effective dose at the site boundary (using distance from site boundary, height of exhaust, and local meteorological conditions) yield total effective dose equivalent (TEDE) and effluent concentrations a factor of 1,000 less than the limits (10 mrem; 1E-7 uCi/ml) listed in 10CFR20 for tritium. The California Code of Regulations defers to the Federal Regulations, specifically 10CFR20, for dose limits to radiation workers, members of the public and effluent from licensed operations.

DIII-D is also registered with the state of California as a radiation producing device. There are 11 devices on the DIII-D site registered with California under Facility Code FAC00042578.

IV. C. 38. Existing, modified or new federal/state permit requirements?

The following permits are currently in effect and will continue:

- APCD (Air Pollution Control District of SD County): Emergency generators, vapor degreasers, fiberglass machining room.
- County of SD, DEH (Dept. of Env. Health): Unified Program Facility Permit: Permit for Facilities that have reportable quantities of hazardous materials and that generate hazardous waste.
- San Diego Fire Department : Permits for Hazardous Materials and Compressed gas systems.
- State of California Dept. of Industrial Relations, Div of Occupational Safety and Health (DOSH): Pressure vessels (air tanks).
- California CHP: Haz Mat transportation license.
- California DMV (Dept. of Motor Vehicles): Motor Carrier permit.
- US Dept of Transportation: Hazardous Materials Cert of Registration.
- US EPA: Federal EPA ID# CA R000198143.

IV. C. 42. Public utilities/services involvement?

Under normal usage, electrical line capacity is sufficient for DIII-D operation. The line was designed to be compatible with DIII-D power demands (peak and average. No expansion of power usage is anticipated. A fault condition, e.g. failure of primary protective device (circuit breaker), could result in loss of power to other utility users sharing the line. Normal water and sewer public services are utilized by the staff of the facility. Most cooling systems are operated closed loop but occasional sewer discharges occur, but are within sewer system handling capacity.