Department of Energy
Washington, DC 20585

December 19, 2002

MEMORANDUM FOR JESSIE HILL ROBERSON
ASSISTANT SECRETARY FOR
ENVIRONMENTAL MANAGEMENT

FROM: MARK W. FREI
DEPUTY ASSISTANT SECRETARY
FOR SITE CLOSURE

SUBJECT: ACTION: Approve shipment of two canisters of Irradiated Fuel Material (IFM) from General Atomics (GA) in La Jolla, California, to the Idaho National Engineering and Environmental Laboratory (INEEL) in fiscal year (FY) 2003.

ISSUE: There are two canisters of the Department of Energy (DOE)-owned IFM (.005 metric ton heavy metal) in safe storage on site at GA that are scheduled to be shipped to the INEEL in FY 2003. Disposition of these canisters completes the Office of Environmental Management's (EM) liability at GA. Approval of this shipment is needed so that efforts can proceed to identify and document, for agreement between Oakland Operations Office (OAK) and Idaho Operations Office (ID), the steps necessary to ensure safe and successful transportation of the IFM between GA and INEEL.

BACKGROUND: Prior to Dismantlement and Decontamination (D&D) of the Hot Cell Facility (HCF) at GA, the DOE-owned legacy IFM from DOE activities was packaged into two canisters and moved from the HCF storage wells to another secure location on the GA site.

With the completion of all EM D&D activities and an independent verification review of the GA HCF in FY 2000 the only remaining EM responsibility is the disposition of the IFM. The former HCF location and associated yard area cleanup has been approved by the DOE, Nuclear Regulatory Commission (NRC) and California for unrestricted use. All contaminated soil was removed from the Hot Cell Yard area and shipped offsite in FY 2001, resulting in a geographic site completion in FY 2001. Surveillance and Monitoring (S&M) of the stored IFM in FY 2002, and preparation

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and shipment of this material to INEEL in FY 2003 are the remaining EM activities. DOE is responsible for the S&M (which includes NRC licensing fees when nuclear material is stored on site) cost for on-site storage of IFM at GA.

DISCUSSION: The most recent INEEL Spent Nuclear Fuel Integrated Transfer Schedule (PLN-845 - May 2002) identifies this DOE-owned IFM to be shipped to INEEL in FY 2003 for interim storage until a national repository is available. INEEL supports the FY 2003 schedule for receipt of GA IFM (based on an assumption that the cask and the internal basket handling arrangements have been previously used at the INEEL).

This SNF shipment is one of multiple SNF shipments to be made by EM and NE in FY 2003. A consolidated transportation plan is being prepared to allow for the FY 2003 SNF shipments to be understood by States/Stakeholders as a campaign.

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Activities including a request for procurement of an appropriate shipping cask and basket design, preparation, and approval are included in the OAK FY 2002/2003 scope of work for completion of the EM activities at GA.

Based on a certified cost estimate, $1.8 million is needed for DOE-OAK to enable shipment of this IFM to INEEL in FY 2003. S&M funds ($300,000) are included in the OAK FY 2003 Congressional Budget request. Funds for the preparation and shipment of this IFM to INEEL in FY 2003 ($1.5 million) have been included and supported in the Cleanup Reform Account. In addition, $840,000 has been identified by the DOE Idaho Operations Office (ID) and included in its FY 2003 budget to support INEEL receipt costs.

Should shipment of the GA IFM to INEEL be constrained by the terms of the Idaho Settlement

Agreement, alternative storage locations such as Hanford will be evaluated and discussions will be initiated.

RECOMMENDATION: EM Headquarters supports shipping the IFM from GA to INEEL in FY 2003 enabling completion of all EM activities for this site. These shipments, upon approval, will be included in the Transportation Plan being prepared by EM-20.

APPROVED: Jessie Roberson

DISAPPROVED: _____

DATE: 12/19/02

Attachment

Report of Assessment for
Transportation of General Atomics Irradiated Fuel Material to INEEL

Objective:

Assess whether the Department of Energy (DOE) is ready to transport Irradiated Fuel Materials (IFM) from General Atomics (GA), La Jolla, California to the Idaho National Engineering Environmental Laboratory (INEEL) in FY 2003 for interim storage.

A multi-disciplinary team consisting of members of Environmental Management (EM) organizations that have oversight responsibilities associated with this project and/or the transfer of this type of material performed this assessment. Representatives from headquarters, as well as, the Idaho and Oakland Operations Offices participated on the team (Team List - Appendix A). The team met several times over a three month period, to discuss and review information pertaining to the transfer of this IFM to verify DOE's readiness to transfer the IFM in FY 2003.

Description of Fuel:

The Irradiated Fuel Material (IFM) to be shipped to INEEL is one canister each of High Temperature Gas-Cooled Reactor (HTGR) and Reduced-Enriched Research Test Reactor (RERTR) irradiated fuel materials. This IFM is highly radioactive fissile fuel material specimens associated with DOE-sponsored nuclear fuel design, research, and development programs conducted by GA. The fuel was retained in the Hot Cell Facility (HCF) for historical purposes. The HCF operations were performed subject to NRC Special Nuclear Material License No. SNM-696 and California (CAL)-Department of Health Services Radioactive Materials License No. 0145-80. The HCF was routinely inspected and reviewed by these agencies. In October 1995 (Ref. #1) this fuel was characterized to estimate the waste volumes to be removed and to develop criteria for storage, packaging, transportation, and disposal. The HTGR/IFM is comprised of highly enriched uranium loose ceramic fuel particles and fuel compacts taken from several GA fuel test elements. A description of the IFM (Ref . #8) is as follows:

Description of Irradiated Fuel Handling Units (FHU)

DESCRIPTION	FHU #032230	FHU #032231
Contents	RERTR IFM, Intact and Sectioned Elements	HTGR IFM, Scraps
Height (Overall)	37.25 inches	39.05 inches
Outside diameter	4.75 inches	5.25 inches
Weight	34.474 kg	32.432 kg
Canister Material	304 SS Tubing Body; INCONEL Alloy 600 Plate End Caps	304 SS Tubing Body; INCONEL Alloy 600 Plate End Caps
Total Activity	2920 Curies	483 Curies
Dose Rate, Maximum Unshielded	3507 R/ hr	1067 R/hr
Surface Contamination	2700 dpm/100 cm^2 $\beta+\gamma$, 13 dpm/100 cm^2 α	4000 dpm/100 cm^2 $\beta+\gamma$, 40 dpm/100 cm^2 α

Background/ Project Scope

The GA HCF is a privately owned, NRC-licensed, nuclear facility located in La Jolla, California. Beginning in the 1950s, the DOE contracted with GA to use the HCF for various nuclear research programs. In 1991, GA decided that HCF business was no longer lucrative and petitioned the NRC to cease operations within the facility. Soon after the NRC accepted GA's request, DOE's Office of Environmental Restoration accepted the GA HCF Decontamination and Decommissioning (D&D) Project into its cleanup program as a cost-shared project in which DOE would fund 76 percent of cleanup and GA would fund 24 percent.

Contract negotiations were completed in 1991 and beginning in 1992, DOE allocated funds to begin the project. Under the direction of the EM program the HCF D&D project was divided into three phases of work. Phase 1 entailed characterization of the facility and surrounding grounds, included the preparation of required NEPA documents, Program Management and Planning documents, a Characterization Report and the NRC-approved Decommissioning Work Plan. During Phase 1 DOE-owned legacy irradiated fuel material located in HCF storage wells, was packaged in two separate fuel canisters to meet Oak Ridge National Laboratory (ORNL) criteria and standards.

National Laboratory (ORNL) criteria and standards. Original plans were for this material to go to ORNL and it was later decided that it would be shipped to INEEL.

The packaged IFM was transferred from the HCF to an on-site location for temporary storage until transfer to INEEL. The current shipment schedule is to transfer the fuel to the INEEL in FY 2003. While the fuel material awaits shipment to the INEEL, the DOE is providing funds for surveillance and maintenance and related regulatory fees associated with temporary storage of the material. Phase 2 work included facility decontamination and demolition and removal of contaminated surrounding and subsurface soils began in 1997 and was completed in FY 1999. Phase 3 work, completed in FY 2000, included GA's confirmatory sampling and independent sample verification by ORISE and issuance of the GA Final Report (Ref. #4). Upon completion of this work, the Nuclear Regulatory Commission amended its license to release the Hot Cell Facility and associated yard area for unrestricted use in July 2000. Also, because the State of California Department of Health Services oversees work at GA the state issued an amendment to its Radioactive Material License for the Hot Cell Facility and associated yard area for unrestricted use in August 2000.

The baseline schedule planned for a Geographic Site Completion in FY 2000. However, soil recovered from the Hot Cell Yard area was determined to contain radioactive contaminated waste particles, which required disposal at a low-level radioactive waste disposal site. This type of waste and disposal was not part of the original plan or baseline. A request was made and granted during the FY 2001 congressional hearing process, to reallocate the FY2001 budget request within the Oakland Operations Office for $1 million to complete the disposition of this waste. This resulted in a Geographic Site Completion in September 2001. A detailed Chronology of Specific EM Related Events can be found in Appendix B.

Final arrangements for shipping fuel to INEEL in FY 2003 will be under a GA contract modification (Ref.#7).

Discussion

The team reviewed documents and met to discuss the disposition of the two canisters of IFM, scheduled for shipment to INEEL in FY 2003. Topics discussed and reviewed by the team included the description of canisters and contents; shipping cask and basket design, prospective suppliers, request for procurement; questions related to the INEEL's acceptance/receipt of Spend Nuclear Fuel, and GA's quality assurance program. In addition, the team reviewed INEEL's design requirements for GA regarding the cask and basket for fuel transportation and storage.

The original DOE/GA contract and two subsequent modifications were reviewed by the team during this assessment. The most recent contract modification added the disposal of the contaminated soil in the yard resulting from the Hot Cell D&D. At that time, GA prepared a revised cost estimate, which included S&M and IFM disposal in FY 2003. The major difference in the revised cost estimate was an increase of $300,000. This increase allows for parts and labor associated with dry runs to be performed by GA and a security escort during transportation, neither of which were originally in the estimate. An Oakland certified cost estimator validated the cost estimates and this information was provided to the team for information and review. Based on this review GA, OAK, and the review team developed a schedule for disposal of the IFM at INEEL.

Classification or designation of the material is the responsibility of the Safeguards, Security (S&S) Control and Accountability Group at INEEL. Early in 2002, GA submitted an IFM characterization report that was accepted by INEEL. Subsequently, the Required Shippers Data Form (RSD) (INEEL Form 434.28) and Packaging RSD (INEEL Form 434.290) was submitted to INEEL and is currently under review. These submissions initiate characterizing and classifying the IFM by INEEL. In regard to the INEEL acceptance criteria, the Fuel RSD forms and partially completed Packaging RSD forms for the two cans are presently in final review. The contractor memorandum of

agreement (MOA) and DOE shipper/receiver (S/R) agreement for shipping will document acceptance of the material.

The IFM is considered spent nuclear fuel (SNF) and will be received by the INEEL as SNF under the INEEL SNF receipt program. Documentation of this determination will be part of the contractor MOA and S/R agreement between DOE-ID and DOE-OAK with material control and accountability (MCA) sign-off by the GA and the INEEL S&S Organizations. The principal actions that need to be completed are:

- The acceptance of the sealed canisters by DOE for receipt of the SNF by the INEEL. Determination and understanding under the applicable DOE Manual 474.1-1A, Manual for Control and Accountability of Nuclear Materials, will be identified in the S/R agreement and a path forward for resolution established. Examples of this are transfer check, measurement, and foreign use/origin of some of the material. (The sealed cans do not allow for INEEL accountability verification as required by DOE order so DOE-ID must accept the sealed cans in order for the INEEL to receive them).

Project personnel met at Idaho Falls and went through a list of items to be addressed by GA and/or INEEL before the shipment takes place. INEEL has drafted the S/R agreement and the acceptance of the sealed canisters has been initiated. The schedule for completion of these activities is April, 2003. Completion of the contractor MOA and the S/R agreements are contingent on the resolution of the items mentioned above.

Since INEEL is not the final disposal site for the IFM, there is no requirement for Waste Acceptance Criteria (WAC). However, INEEL does have a process for acceptance that shippers are to follow. That process is described in "Standard for Receipt of Spent Nuclear Fuel," STD-1120. INEEL and GA have identified and will meet the applicable standards that pertain to the shipping of the IFM.

Next Steps

General Atomics and DOE Oakland are responsible for developing and obtaining INEEL's approval on the Statement of Work (SOW) for the Request for Procurement for an open bid fixed price contract to supply the shipping cask and transportation services for transporting the IFM to Idaho. The SOW technical requirements are to include a cask(s) Certificate of Compliance that will be issued by NRC. It will also outline cask(s) specifications that are needed to protect and safely handle IFM during transport. One of the first steps in the process will be to transfer the IFM canisters to the cask(s) prior to shipment. This is to be accomplished in the GA TRIGA Reactor Facility, Building 21. The quality assurance requirements for the cask(s) will comply with the Code of Federal Regulations, Title 10, Part 71 (10 CFR 71), Packaging and Transportation/NRC will be required to license the cask(s). The shipments will be made by truck from GA to Irradiated Fuel Storage Facility at INEEL.

A transportation plan (from the prospective contractor) is to be prepared to address a minimum of seventeen items, including but not limited to: logistical details on the shipping agents, freight carriers, emergency point of contacts, mode of transportation, radioactive shipment records, DOE Order 5633.3B "Guide of Implementation Instruction for Nuclear Materials Management and Safeguards System Reporting and Data Submission", and Form DOE/NRC 741, Cask(s) loading diagram, emergency response plans, and transportation schedule. In addition, a management plan is required that will provide the project description, manager, risk mitigation, and scope, cost, and schedule details.

Several commercially owned casks that are already acceptable to INEEL could be used for this project. When the contract and a schedule are prepared, a cask will be identified and the contractor and INEEL will agree on the cask specifications. The contractor will be responsible for obtaining a modification to the NRC certificate for the existing cask in order to accommodate the IFM. The transportation route will not be decided until later in the project. Once a transportation route is proposed the contractor, GA, and DOE will meet with the States affected to finalize an acceptable route. To facilitate the

transportation, INEEL is currently assuming that GA will contract with a supplier that has a commercially approved shipping cask for the shipment that has already been accepted (with necessary modifications) and used to ship materials to INEEL.

Results

Representatives from the Oakland Operations Office, GA, and INEEL were members for this review and continue to interact regarding specifics of the transfer. The primary issue identified and resolved during the review was the availability of funding both at OAK and INEEL. OAK has requested funds within the total Oakland FY 2003 Budget Request (including Cleanup Reform Account funding) to prepare the IFM for shipment. INEEL has agreed to provide funds from their FY 2003 budget to support receipt and storage of the IFM.

The team identified no specific issues related to transportation or acceptance of the fuel at INEEL, however, a Memorandum of Agreement should be developed between ID and OAK outlining the scope of work and the commitments. INEEL and GA will continue to meet to discuss the specifics of the cask design and acceptance criteria. Final disposition of the IFM completes all DOE Environmental Management programmatic and financial commitments at GA. Based on the assessment by the review team, it was determined that EM is ready to perform the tasks remaining to ship the IFM from GA to INEEL in FY 2003. This report was prepared to document the assessment of the readiness of EM to complete the IFM portion of the project work scope.

APPENDIX A

Assessment Team Members

Kathy Angleberger, EM-34 (Project Manager, Lead)

Mike Conroy, EM-45 (Transportation/Packaging)

Virgil Lowery, EM –41 (Idaho Nuclear Spent Fuel)

Howard Eckert, EM-21 (Spent Fuel Team)

Jim Wade, DOE/INEEL

James Davis, III, OAK

Consulting Members were:

George Garey, EM 12 (Budget)
Ruben Develasco, GA
Roger Liddle, OAK

APPENDIX B

CHRONOLOGY OF EVENTS

Early 1993	HCF proposed to DOE as a D&D candidate due to lack of work. HCF declared surplus by DOE-NE and transferred from NE and accepted by DOE-EM-40.
April 1993	GA awarded a sole-source contract for Phase 1 of the GA HCF D&D Project
April 1993	Contractor mobilized.
July 1993	EM accepts responsibility to fund and manage the disposition of the NE legacy Irradiated Fuel Materials (IFMs)
November 1993	Draft Environmental Assessment issued for the D&D of the GA HCF.
November 1993	Inventory reports for the legacy waste (HTGR, TFE, ESTES, and general facility) and building stored IFMs.
December 1993	Approval granted by the CA State Department of Health Services, Radiological Health Branch to move the IFMs from HCF Building 23 to GA Building 30, Room 118.
February 1994	Fuel Materials Characterization Plan completed and submitted to DOE.
March 1994	Phase 1 Contract statement of work modified to include disposition of legacy waste (HTGR, TFE, ESTES, and general facility) and the management of the IFMs
May 1994	Site and Facility Characterization Plan completed and submitted to DOE
June 1994	Operational Readiness Review conducted for Phase 1 activities.
July 1994	Subcontract for asbestos characterization activities awarded.
July 1994	Westinghouse Hanford conducts off-site assessment of HCF D&D Project waste operations.
September 1994	DOE grants approval to commence Phase 1 activities.
September 1994	Radiological characterization and soil assessment activities commence.
October 1994	Asbestos sampling is completed.
November 1994	Facility sampling and soil coring for characterization completed.
December 1994	Westinghouse Hanford designates GA an "Approved Waste Generator."
December 1994	GA formally notifies NRC of intent to cease "principal activities" at the Hot Cell Facility.
January 1995	Hanford approves GA Waste Certification Plan.
January 1995	Radiological waste shipping begins.
July 1995	GA Hot Cell Site and Facility Characterization Report approved by DOE.
July 1995	GA Hot Cell Facility Decommissioning Plan submitted to NRC and CA-DHS.

July 1995	Five cask shipments of remote handled, category 3, LLW sent to Hanford.
August 1995	DOE Letter Contract issued to GA for Hot Cell D&D, Phases 2 and 3 of the HCF D&D Project.
August 1995	DOE issued the Final Environmental Assessment for the HCF D&D Project and subsequently a FONSI was issued.
August 1995	Contractor mobilized for Phases 2 and 3, and Phase 2 activities commenced.
November 1995	GA Hot Cell Phase 1 activities completed.
December 1995	Operational Readiness Review conducted for IFM transfer activities.
December 1995	IFMs transferred from the HCF (Building 23) to GA Building 30, Room 118.
January 1996	DOE definitized the Letter Contract for HCF D&D, Phases 2 and 3.
February 1996	Operational Readiness Review for Phase 2 decommissioning activities conducted.
February 1996	GA Hot Cell Facility Decommissioning Plan approved by CA-DHS.
May 1996	GA Hot Cell Facility Decommissioning Plan interim approval by NRC.
May 1996	Decommissioning activities commenced (removal of interior walls).
December 1996	Sixth cask shipment of remote handled, category 3 LLW sent to Hanford.
January 1997	GA Hot Cell Facility Decommissioning Plan approved by NRC.
March 1997	Shipment of equipment removed from the cells (8 Model E Manipulators, 1 Koll-Morgan Periscope, 1 PaR, and 1 Metalograph) to GE for reuse (recycle measure) completed.
July 1997	Six HCF window assemblies packaged and shipped to Hot Cell Services in Washington to be refurbished and recycled.
October 1997	Underground diesel storage tank removal and closure completed.
November 1997	ORR for HEPA system shutdown conducted.
December 1997	Building decontamination activities completed.
January 1998	Dismantlement of interior walls and ceilings completed.
March 1998	Hot Cell Facility HEPA system shut down.
May 1998	Dismantlement of roof and exterior walls completed.
July 1998	Dismantlement of High Level Cell, Low Level Cell and Metallurgy Cell completed.
October 1998	Dismantlement of the building storage pits and wells completed.
October 1998	Dismantlement of building operating systems and services completed.
October 1998	Dismantlement of building below ground service lines completed.
October 1998	Dismantlement of the Hot Cell Facility completed.
October 1998	Approval to ship contaminated soil and debris to Envirocare received.

November 1998	Shipments to Envirocare initiated.
November 1998	Final Radiological Survey Plan submitted to NRC for review.
September 1999	Soil and debris shipments to Envirocare completed (174 shipments).
September 1999	Independent survey activities commence (ORISE) on pits and trenches.
November 1999	IFMs relocated from Building 30, Room 118, to GA Building 31, Room 103A to avoid interference with other GA activities.
December 1999	GA radiological surveys completed.
March 2000	GA confirmatory radiological surveys completed.
March 2000	Independent verification activities completed (ORISE and NRC)
March 2000	NRC and CA-DHS receive GA Final Survey Report and request to release the GA Hot Cell Site to unrestricted use.
June 2000	ORISE Final Report on Verification Survey of the GA Hot Cell Site issued.
July 2000	Hot Cell Site released to unrestricted use by NRC (by license amendment).
August 2000	Hot Cell Site released to unrestricted use by CA-DHS (by license amendment).
February 2001	Approval to ship radiologically contaminated soil and asphalt stored in a GA lay-down area to Nevada Test Site received.
March 2001	Shipments to NTS initiated.
March 2001	Shipments to Hanford completed (438 Y-4 boxes, 6 cask liners of waste, 79 slabs, 14 wells, 7 shield doors, and miscellaneous equipment).
April 2001	All GA Site Treatment Plan Milestones of the GA Compliance Order under the FFCA completed.
May 2001	Soil shipments to NTS completed (100 shipments)
June 2001	All radiological waste disposal activities complete.
September 2001	Hot Cell Facility decommissioning activities complete.

References

1. **HGR/RERTR FUEL MATERALS CHARACERIZATION REPORT** PC-000384/0, prepared for GA Hot Cell D&D Project, Contract No. DE-AC03-84SF11962, Modification No. A-041, Project NO. 7320, dated January 1995

2. **GENERAL ATOMICS IRRADIATED FUEL MATERIALS AND NON-FUEL RADIOACTIVE WASTE MATERIAS CHARACTERIZATION PLAN** PC-000382/2, prepared for GA Hot Cell D&D Project, Contract No. DE-AC03-84SF11962, Modification No. A-041, Project NO. 7320, dated October 1995

3. **SAFEGUARDS AND SECURITY MEASURES FOR THE IRRADIATED FUEL MATERIAL TEMORARY STORAGE FACILITY AT GENERAL ATOMICS** PC-000457/1, prepared for GA Hot Cell D&D Project, Contract No. DE-AC03-895SF20798, Project NO. 7340, dated January 2000

4. **GENERAL ATOMICS HOT CELL FACILITY DECOMMISSIONING PROJECT, FINAL REPORT**, PC000499/0, prepared for D&D Project, Contract No. DE-AC03-95SF20798, Project NO. 7350, dated September 2001

5. **HGR/RERTR FUEL MATERALS CHARACERIZATION AND PACKAGING REPORT** PC-000384/2, prepared for GA Hot Cell D&D Project, Contract No. DE-AC03-95SF20798, Project NO. 7340, dated April 2002

6. **GENERAL ATOMICS HOT CELL FACILITY DECOMMISSIONING PROJECT FINAL REPORT HGR/RERTR FUEL MATERALS CHARACERIZATION AND PACKAGING REPORT** PC-000384/2, prepared for GA Hot Cell D&D Project, Contract No. DE-AC03-95SF20798, Project NO. 7340, dated April 2002

7. **GA Hot Cell D&D Project, Contract No. DE-AC03-95SF20798**, Project NO. 7340, November, 1999, and subsequent modifications – February 2000, March 2001

8. **SHIPMENT OF HTGR/RERTR IRRADIATED FUEL MATERIALS FROM GENEARL ATOMICS TO THE TIDAHO NATINAL ENGINEERING AND ENVIRONMENTAL LABOARTORY** Generation Atomics RFQ No. 2021, Statement of Work, May 2, 2002