



**Department of Energy**  
Washington, DC 20585

**MAR 01 2000**

The Honorable John T. Conway  
Chairman  
Defense Nuclear Facilities Safety Board  
625 Indiana Avenue, N.W.  
Suite 700  
Washington, D.C. 20004-2901

*John*  
Dear Mr. Chairman:

This letter informs you of the completion of Commitment 121, "Provide a revised completion date for the completion of polycube stabilization, if different from August 2002." This commitment is included in the Implementation Plan (IP) for the Defense Nuclear Facilities Safety Board, Recommendation 94-1, Remediation of Nuclear Materials in the Defense Nuclear Facilities Complex, Rev. 2. Presently, there is no change to the August 2002 completion date; this letter documents the Department's rationale for no change. Enclosed is the current schedule and other supporting documentation.

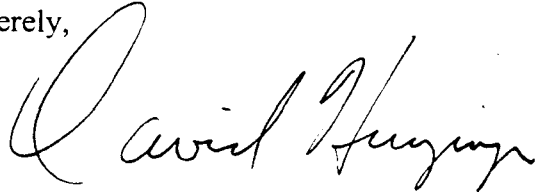
Revision 1 of the IP included a polycube stabilization completion date of August 2002. At the time of the Department's issuance of Revision 2, a preliminary evaluation indicated that the process for stabilizing the polycubes could be simplified from pyrolysis followed by thermal stabilization to direct thermal stabilization. The preliminary evaluation also indicated that the off-gas concerns were of lower hazard than had been anticipated earlier. Because of the uncertainty in the stabilization path forward process and in the associated risk, the Plutonium Finishing Plant Integrated Project Management Plan (IPMP) prioritized stabilization of other materials (primarily metals and solutions) ahead of the polycubes and showed a polycube stabilization completion date of March 2004, significantly beyond August 2002. The intent of Commitment 121 was to ensure that the August 2002 date could be met, or if not, propose an alternate later date.

The IPMP assumed all five furnaces would support oxidation of the resultant product from magnesium hydroxide precipitation process for solution stabilization during early fiscal year 2001. Preliminary testing shows that all five furnaces may not be needed for solution stabilization. The polycube stabilization could be initiated as early as October 2000. Presently, the Department believes polycube stabilization can be completed on or before August 2002. Several preliminary opportunities have been identified that show the August 2002 date can be

accelerated; however, due to uncertainty in furnace requirements and radiation exposure issues, the rate of acceleration cannot be determined at this time. The basis for any acceleration will be better known after further evaluations. A schedule showing the most likely scenario is enclosed.

We continue to closely track progress on all Recommendation 94-1 commitments and will keep you and your staff apprised of our progress. If you have any questions, please contact me at (202) 586-5151 or Mark W. Frei, Deputy Assistant Secretary for Project Completion, at (202) 586-0370.

Sincerely,

A handwritten signature in black ink, appearing to read "David Huizenga". The signature is fluid and cursive, with a large initial "D" and "H".

David G. Huizenga  
Deputy Assistant Secretary  
for Integration and Disposition  
Office of Environmental Management

Enclosure

cc w/enclosure:  
M. Whitaker, S-3.1



**Department of Energy**  
Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352

00-MDD-048

FEB 29 2000

Mr. R. D. Hanson, President  
Fluor Hanford, Inc.  
Richland, Washington 99352

Dear Mr. Hanson:

CONTRACT NO. DE-AC06-96RL13200 - COMPLETION DATE FOR POLYCUBES  
PROCESSING (REVISED)

Reference is made to the letter (FH-0000952 R1), from G. W. Jackson, FHI,  
to P. M. Knollmeyer, RL, dated February 28, 2000, Completion Date for Polycubes  
Processing.

RL has reviewed the referenced letter and available supporting documentation for the  
stabilization of the entire polycube inventory at Plutonium Finishing Plant (PFP). RL concurs  
with the polycube schedule for completion of polycube processing by August 2002. Technical  
approval for this work will be batch thermal stabilization.

This schedule is consistent with DOE's position to have high-confidence baseline in support of  
Defense Nuclear Facilities Safety Board (DNFSB) commitments. RL recognizes and encourages  
FHI's continuing efforts of exploring and developing innovative approaches to accelerate  
polycube stabilization completion as discussed in the referenced letter.

RL concurrence of this schedule completes Commitment #121 "Provide a revised completion  
date for the completion of polycubes stabilization, if different than August 2002," from  
Revision 2 of the Implementation Plan for the DNFSB Recommendation 94-1, Remediation of  
Nuclear Materials in the Defense Nuclear Facilities Complex.

RL expects this schedule to be reflected in the next revision of the PFP Integrated Project  
Management Plan.

02/29/00 TUE 16:58 FAX 509 372 3508


Mr. R. D. Hanson  
00-MDD-048

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FEB 29 2000

If you have any questions, please contact Pete Knollmeyer, Office of Nuclear Materials and Facility Stabilization, on (509) 376-7435, or your staff may contact Harry E. Bell, Materials Disposition Division, on (509) 376-2347 or Mark R. Hahn, Materials Disposition Division, on (509) 373-9872.

Sincerely,



Sally A. Stieracki  
Contracting Officer

MDD:HEB

cc: C. L. Huntoon, EM-1  
J. M. Owendoff, EM-2  
D. G. Huizenga, EM-20  
J. C. Tseng, EM-21  
M. W. Frei, EM-40  
R. L. Kaltreider, EM-43  
J. E. Newson, EM-43  
J. A. Turi, EM-43  
M. B. Whitaker, Jr., US  
A. F. Shattuck, FDNW  
G. W. Jackson, WSMS  
J. G. McKibbin, WSMS  
R. L. McQuinn, WSMS



**FLUOR DANIEL**

Fluor Daniel Hanford, Inc.  
P.O. Box 1000  
Richland, WA 99352

February 28, 2000

FH-0000952 R1

Mr. P. M. Knollmeyer, Assistant Manager  
Nuclear Materials and Facility Stabilization  
U.S. Department of Energy  
Richland Operations Office A5-11  
Post Office Box 550  
Richland, Washington 99352

Dear Mr. Knollmeyer:

**CONTRACT NO. DE-AC06-96RL13200 - COMPLETION DATE FOR POLY-CUBES  
PROCESSING**

The Plutonium Finishing Plant (PFP) team has completed its evaluation of polycube processing and developed a schedule. The schedule is based upon processing the polycubes via thermal oxidation in muffle furnaces. On the basis of tests performed on actual polycubes, we are confident that thermal oxidation can be safely performed in muffle furnaces. The schedule in Attachment 2 shows that we expect to complete polycube processing on or before the Defense Nuclear Facilities Safety Board 94-1 Implementation Plan (IP) commitment date of August 2002.

The start-up date for polycubes processing is anticipated in late October 2000. This start date is dictated by the need to complete National Environmental Policy Act and authorization basis documentation. It is also the result of the multiple start-ups scheduled for the latter part of fiscal year 2000. Between June and September we will be starting up residues stabilization, a second bagless transfer system, and solutions processing. The polycube start-up review will follow these.

The basis for polycube processing is shown in Attachment 1. Processing is based on 400 gram bulk weight of polycubes per charge being processed in 2 dedicated furnaces in 234-5Z. Using this basis, polycube processing would be completed in late July 2002. This supports the August 2002 completion date, but is not sufficiently different to warrant changing the IP commitment.

Testing currently underway at Pacific Northwest National Laboratory (PNNL) and Plutonium Process Support Laboratories (PPSL) is producing data to support safety analysis calculations. The testing will be documented in a series of reports from PNNL and PPSL. Results of the cold polycube testing performed last year will be issued in March. The final PNNL report providing hydrocarbon evolution rates for full polycubes



Mr. P. M. Knollmeyer

FH-0000952 R1


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will be issued by mid-April. The final PPSL testing document providing test results from thermal stabilization of several full polycubes will be issued in late April. Calculations related to safe charge size will be issued in early May. Testing and calculations done to date support thermal stabilization of 400 grams bulk polycubes as a safe alternative to pyrolysis. It is our belief that these testing results and safety calculations will support an increased charge size (800 grams bulk polycubes). Increasing the charge size to 800 grams will significantly accelerate the processing of polycubes. In addition, a dose study of polycube processing is currently being performed and will be completed in May 2000. This study will be used to identify ALARA techniques and add confidence to the proposed polycube schedule.

If you have questions related to the PFP polycube processing commitment, please contact Mr. John McKibbin at 373-7353.

Very truly yours,

  
G. W. Jackson, Vice President  
Nuclear Material Stabilization  
Fluor Hanford

afs

Attachments

**ATTACHMENT 1**

**FH-0000952 R1**

**COMPLETION DATE FOR POLYCUBES PROCESSING  
POLYCUBE PROCESSING BASIS**

**Consisting of 2 pages, including coversheet**

**Attachment 1**  
**Polycube Processing Basis**

The one over arching assumption made is that personnel exposure will be managed so it does not restrict processing. Dose measurements of polycubes are extremely high (up to 20 Rcm) and will require a strong ALARA effort to minimize exposure. Two teams are identifying options to minimize the exposure from handling and processing polycubes.

**Baseline**

260 cans of polycubes at 800 grams bulk per can

Boat charge size is 400 grams bulk polycubes

2 furnaces dedicated to polycube processing (Solutions processing rates will only require 2-3 furnaces)

One run per day per furnace using a modified calcination cycle. The furnace will be left at a few hundred degrees C for several hours until oxidation of the organic is complete. The amount of time and temperature to be used will be determined as part of the testing and process optimization work underway at PNNL and PPSL. It is expected the cycle time will be 18-20 hours.

Total Operating Efficiency (TOE) = 60%

260 cans of polycubes @ 2 charges per can = 520 charges

520 charges / (5 charges per week per furnace x 2 furnaces x 0.6 TOE) = 520/6 = 87 weeks to process 260 cans of polycubes

Therefore, processing will take place from November 2000 through July 2002

**Acceleration Opportunity**

If the charge size is increased to 800 grams as result of the testing, the schedule will show significant improvement.

Only 260 charges will be required since each boat will hold a full can of polycubes

260 charges / (5 charges per week per furnace x 2 furnaces x 0.6 TOE) = 260/6 = 43 weeks to process 260 cans of polycubes

On this basis, processing will take place from November 2000 through August 2001

Note: If Total Operating Efficiency is improved to 80% (for example) from the 60% assumed, the base line schedule can be reduced by about 6 months and the Acceleration Opportunity Case schedule can be improved by about 2 months.



**ATTACHMENT 2**

**FH-0000952 R1**

**COMPLETION DATE FOR POLYCUBES PROCESSING  
NUCLEAR MATERIAL STABILIZATION POLYCUBE SCHEDULE**

**Consisting of 2 pages, including coversheet**

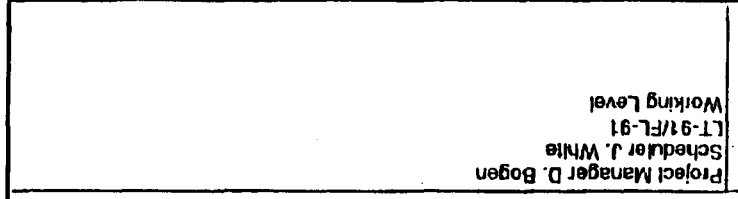
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 Progress Bar: ██████████  
 Critical Activity: ██████████

Fluor Hanford  
 Nuclear Material Stabilization Project  
 Polycubes  
 PFP Project Control

Project Manager D. Bogen  
 Scheduler J. White  
 LT-91/FL-91  
 Working Level

Sheet 1 of 1



ID	Description	Early Start	Early Dur	Finish
POEADJ1	POLYCUBE PROJECT MANAGEMENT	668	668	14OCT02
	Final Report	46	77	26APR00
	Final Review	83	83	30MAY00
	Final Review	175	175	07SEP00
	Final Review	115	115	07SEP00
	Final Review	30	30	20OCT00
POSTPOD12	Complete Startup Review	30	30	11SEP00
POSTPOD13	Polycube Processing Operations	456	456	23OCT00
	Polycube Processing Operations	456	456	14AUG02

EX00  
 DEC JAN FEB MAB APR MAY JUN JUL AUG SEP OCT