

JCN - J5167

MONTHLY LETTER STATUS REPORT
For July 2002

Project Title: Spent Fuel Review Assistance
Period of Performance: February 3, 1997 - September 30, 2003
JCN: J5167
PNNL Project Manager: M. A. Khaleel (509-375-2438)
Address: PO Box 999, Mail Stop K2-18
Richland, WA 99352
Facsimile: 509-375-6605
NRC Project Manager: P. Kinney (301-415-7805)
NRC Technical Monitor: C. Bajwa (301-415-1237)

Project Objective: The objective of this project is to conduct safety and environmental reviews and development of regulatory guidance related to Independent Spent Fuel Storage Installations and Dry Cask Storage facilities.

Task Orders 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 & 11 COMPLETED

Task #12

Title: Development and Analysis of Spent Fuel and Radioactive Material Cask Models for Casework Evaluations

JCN: J5167

PNNL Task Manager: T. E. Michener (509-375-2162)
NRC Technical Monitor: C. Bajwa (301-415-1237)

OBJECTIVE

The objective of this task order is to provide package analyses in support of ongoing casework using the ANSYS, ANSYS LS-DYNA FEA, COBRA-SFS, and Star-CD packages.

PROGRESS DURING REPORTING PERIOD

In July PNNL staff performed the following:

- PNNL staff continued to work with the substitute TN-32PT ANSYS model involving a solid rail design provided by the applicant, to determine the appropriateness of the approach and the variation of results when compared to PNNL's original COBRA-SFS modeling effort. Findings and recommendations were provided verbally to the NRC technical monitor. At the end of the month, a meeting was held back at NRC headquarters to discuss the non-standard approach applied by the applicant.

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- The Baltimore Tunnel Fire model was resurrected and evaluated for extrusion into a 3D transient version. The NIST report associated with this event was reviewed for applicable initial and time dependent boundary conditions. More effort will be directed to this task over the next two months.
- PNNL staff provided ANSYS support to the NRC for the purpose of constructing an MP 197 transport package including the decoupled modeling of the package and payload. More effort will be directed to this task over the next two months.

TRAVEL

Tom Michener and Harold Adkins traveled to Washington DC July 31 - August 4, 2002.

REPORT, PAPERS, AND PUBLICATIONS

None.

ANTICIPATED AND ENCOUNTERED PROBLEM AREAS

None.

PLANS FOR NEXT REPORTING PERIOD

PNNL staff will continue to support the TN32 review efforts via COBRA-SFS confirmatory analyses and investigations into the ANSYS modeling approach used by the applicant.

A COBRA-SFS analysis of the TN24PHB cask will be initiated in August.

FINANCIAL STATUS AND VARIANCE ANALYSIS

See attached financial status report. The cost and funding information reported on the Cost Status by Element Table includes the necessary adjustments to account for the DOE Adder. All other cost information reflects only the Pacific Northwest National Laboratory costs and does not include the DOE Adder.

PROPERTY AND SOFTWARE

None.

Task #13

Title: Dynamic Structural Analyses in Support of Risk-Informing 10 CFR Part 71

JCN: J5167

PNNL Task Manager: H. E. Adkins (509-372-6629)
NRC Technical Monitor: D. T. Huang (301-415-3381)

OBJECTIVE

The objectives of this task order are to: 1) compare the structural analyses results of NUREG-6672 using the ANSYS LS-DYNA FEA packages with selected spent fuel transportation packages currently certified by the NRC; and 2) Train selected NRC staff members in the use of ANSYS LS-DYNA in cask analyses.

PROGRESS DURING REPORTING PERIOD

In July PNNL staff performed the following:

- Initiated review of the NRC document NUREG 6672.
- Installed the LS-DYNA software on the machine anticipated to be used for the NUREG 6672 evaluation work. The procurement process of obtaining an LS-DYNA software lease was initiated. A temporary license was obtained for the purpose of verifying software package installation and performing some exemplary transport package evaluations. Successful installation was verified.
- Performed some preliminary investigation to ascertain the impact of a potential scope change based on a request issued by the NRC. The potential scope change would involve the incorporation of performing impact evaluations of high burnup (70 GWD) SNF assemblies during transport accidents scenarios as defined in NRC document NUREG 6672.

TRAVEL

None.

REPORT, PAPERS, AND PUBLICATIONS

None.

ANTICIPATED AND ENCOUNTERED PROBLEM AREAS

None.

PLANS FOR NEXT REPORTING PERIOD

Generate an approach and estimate associated with performing structured and detailed impact evaluations of high burnup SNF assemblies during transport accidents scenarios as defined in NRC document NUREG 6672. This is being performed at the request of the NRC. Also, it is anticipated that PNNL staff will be able to begin construction of the first of two identified SNF transport systems after discussing the anticipated approach and obtaining approval from the NRC.

FINANCIAL STATUS AND VARIANCE ANALYSIS

See attached financial status report. The cost and funding information reported on the Cost Status by Element Table includes the necessary adjustments to account for the DOE Adder. All other cost information reflects only the Pacific Northwest National Laboratory costs and does not include the DOE Adder.

PROPERTY AND SOFTWARE

The procurement process of obtaining an LS-DYNA software lease was initiated. A temporary license was obtained for use of the software during procurement/lease processing.

SPENT FUEL REVIEW ASSISTANCE

M. A. Khaleel
(509) 375-2438
July 2002

	<u>Current Month</u>	<u>FYTD</u>	<u>Cumulative To Date</u>
I. Direct Staff Labor Hours	130.0	2,773.5	14,103.7
II. Direct Salaries	7,072	163,995	730,655
Materials & Services (Excluding ADP)	0	1,514	6,395
ADP Support	0	0	0
Subcontracts	0	0	57,316
Travel Expenses	0	3,274	44,083
Indirect Labor Costs	3,343	72,673	320,535
Other Direct Costs	569	13,224	75,439
G&A, Nuclear, and Serv Assmt	4,962	114,417	538,829
Total PNNL Costs	\$15,946	\$369,097	\$1,773,252
Percent Spent		71%	92%
Total Costs to NRC (Includes DOE Adder)	\$16,424	\$380,170	\$1,830,229

III. Overall Funding Status

PNNL Available Funding (Adjusted: Reflects DOE Adder Initiated in FY92)

<u>Total JCN Funding</u>	<u>Prior FY Carryover</u>	<u>FY02 Projected Funding Level</u>	<u>FY02 Funds Received to Date</u>	<u>FY02 Funding Bal. Needed</u>
\$1,926,828	\$134,706	TBD	\$387,967	\$145,631

NRC Funding Provided to DOE

<u>Total JCN Funding</u>	<u>Prior FY Carryover</u>	<u>FY02 Projected Funding Level</u>	<u>FY02 Funds Received to Date</u>	<u>FY02 Funding Bal. Needed</u>
\$1,988,100	\$138,747	TBD	\$399,606	\$150,000

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Task Funding Status (PNNL dollars)

Task No.	NRC \$ Task Funds	PNNL \$ Task Funds	NRC Funds Rec To Date	PNNL Funds Rec. To Date	Monthly Costs	Cumulative Costs	Remaining Funds	Additional NRC Funds Requested
Unobligated \$	0	0	0	0	0	0	0	0
01	18,089	17,343	18,089	17,343	0	17,343	0	0
02	50,729	48,638	50,729	48,638	0	48,638	0	0
Sub-Total	68,818	65,981	68,818	65,981	0	65,981	0	0

NOTE: PNNL received a stop work order on the tasks above.

03 (complete)	191,974	185,743	191,974	185,743	0	184,880	863	0
04 (complete)	50,400	48,322	50,400	48,322	0	48,291	31	0
05 (complete)	298,139	288,169	298,139	288,169	0	288,164	5	0
06 (complete)	113,503	110,197	113,503	110,197	0	110,197	0	0
07 (complete)	155,400	150,874	155,400	150,873	0	150,785	88	0
08 (complete)	165,300	160,485	165,300	160,485	0	159,744	741	0
09 (complete)	352,800	342,524	352,800	342,524	0	342,515	9	0
10 (complete)	228,200	221,553	228,200	221,553	0	221,549	4	0
11 (complete)	154,700	150,194	113,564	110,256	0	110,249	7	41,136
12	200,000	194,175	200,000	194,175	15,159	90,110	104,065	0
13	200,000	194,175	50,000	48,544	788	788	47,756	150,000
Total	2,179,234	2,112,393	1,988,100	1,926,828	15,946	1,773,252	153,570	191,136

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Task 09

CSFM Methodology for Calculating Cladding Temperature Limits for High Burnup

1. Financial Summary

PNNL Available Funding (Adjusted: Reflects DOE Adder Initiated in FY92)

Authorized Cost Ceiling	Funding Obligation	Period Costs	Total Costs to Date	Cumulative Percent Spent
\$342,524	\$342,524	\$0	\$342,515	100.0%

NRC Funding Provided to DOE

Authorized Cost Ceiling	Funding Obligation	Period Costs	Total Costs to Date	Cumulative Percent Spent
\$352,800	352,800	\$0	\$352,790	100.0%

2. Task Cost Status:

	Current Month	Fiscal Year to Date	Cumulative To Date
Direct Staff Labor Hours	0	39	2,625
Labor	\$0	6,071	\$313,388
Travel Expenses	0	0	9370
Service Equipment Centers	0	0	\$530
Other Intermediate Costs	0	0	\$0
Value Added Overheads	0	0	\$0
Services - Other RL Contractors	0	0	\$0
Procurements	0	0	\$439
Subcontracts	0	0	\$18,786
Total PNNL Costs	\$0	\$6,071	\$342,515
Total Costs to NRC	\$0	\$6,253	\$352,790
(Includes DOE Adder)			

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Task 10

Advanced NUHOMS Thermal Analysis

1. Financial Summary

PNNL Available Funding (Adjusted: Reflects DOE Adder Initiated in FY92)

<u>Authorized</u>	<u>Funding</u>		<u>Total</u>	<u>Cumulative</u>
<u>Cost Ceiling</u>	<u>Obligation</u>	<u>Period Costs</u>	<u>Costs to Date</u>	<u>Percent Spent</u>
\$221,553	\$221,553	\$0	\$221,549	100.0%

NRC Funding Provided to DOE

<u>Authorized</u>	<u>Funding</u>		<u>Total</u>	<u>Cumulative</u>
<u>Cost Ceiling</u>	<u>Obligation</u>	<u>Period Costs</u>	<u>Costs to Date</u>	<u>Percent Spent</u>
228,200	228,200	\$0	\$228,197	100.0%

2. Task Cost Status:

	<u>Current</u>	<u>Fiscal</u>	<u>Cumulative</u>
	<u>Month</u>	<u>Year to Date</u>	<u>To Date</u>
Direct Staff Labor Hours	0.0	1,185.2	1,541.2
Labor	\$0	\$173,324	\$219,381
Travel Expenses	0	229	\$229
Service Equipment Centers	0	76	\$76
Other Prime Costs	0	0	\$0
Value Added Overheads	0	0	\$0
Services - Other RL Contractors	0	0	\$0
Procurements	0	1,154	\$1,862
Subcontracts	0	0	\$0
Total PNNL Costs	\$0	\$174,784	\$221,549
Total Costs to NRC	\$0	\$180,028	\$228,197
(Includes DOE Adder)			

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Task 11

Thermal Hydraulic Analysis Code Verification Technical Support

1. Financial Summary

PNNL Available Funding (Adjusted: Reflects DOE Adder Initiated in FY92)

<u>Authorized</u> <u>Cost Ceiling</u>	<u>Funding</u> <u>Obligation</u>	<u>Period Costs</u>	<u>Total</u> <u>Costs to Date</u>	<u>Cumulative</u> <u>Percent Spent</u>
\$150,194	\$110,256	\$0	\$110,249	100.0%

NRC Funding Provided to DOE

<u>Authorized</u> <u>Cost Ceiling</u>	<u>Funding</u> <u>Obligation</u>	<u>Period Costs</u>	<u>Total</u> <u>Costs to Date</u>	<u>Cumulative</u> <u>Percent Spent</u>
\$154,700	113,564	\$0	\$113,555	100.0%

2. Task Cost Status:

	<u>Current</u> <u>Month</u>	<u>Fiscal</u> <u>Year to Date</u>	<u>Cumulative</u> <u>To Date</u>
Direct Staff Labor Hours	0.0	788.3	891.8
Labor	\$0	\$92,017	\$104,922
Travel Expenses	0	4,772	\$4,772
Service Equipment Centers	0	0	\$0
Other Prime Costs	0	0	\$0
Value Added Overheads	0	0	\$0
Services - Other RL Contractors	0	0	\$0
Procurements	0	554	\$554
Subcontracts	0	0	\$0
Total PNNL Costs	\$0	\$97,343	\$110,249
Total Costs to NRC	\$0	\$100,263	\$113,555

(Includes DOE Adder)

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**Task 12 - Development of Analysis of Spent Fuel & Radioactive Material Cask
Cask Models for Casework Evaluations**

1. Financial Summary

PNNL Available Funding (Adjusted: Reflects DOE Adder Initiated in FY92)

<u>Authorized</u> <u>Cost Ceiling</u>	<u>Funding</u> <u>Obligation</u>	<u>Period Costs</u>	<u>Total</u> <u>Costs to Date</u>	<u>Cumulative</u> <u>Percent Spent</u>
\$194,175	\$194,175	\$15,159	\$90,110	46.4%

NRC Funding Provided to DOE

<u>Authorized</u> <u>Cost Ceiling</u>	<u>Funding</u> <u>Obligation</u>	<u>Period Costs</u>	<u>Total</u> <u>Costs to Date</u>	<u>Cumulative</u> <u>Percent Spent</u>
\$200,000	200,000	\$15,614	\$92,813	46.4%

2. Task Cost Status:

	<u>Current</u> <u>Month</u>	<u>Fiscal</u> <u>Year to Date</u>	<u>Cumulative</u> <u>To Date</u>
Direct Staff Labor Hours	123.5	754.5	754.5
Labor	\$15,159	\$90,104	\$90,104
Travel Expenses	0	0	\$0
Service Equipment Centers	0	0	\$0
Other Intermediate Costs	0	0	\$0
Value Added Overheads	0	0	\$0
Services - Other RL Contractors	0	0	\$0
Procurements	0	6	\$6
Subcontracts	0	0	\$0
Total PNNL Costs	\$15,159	\$90,110	\$90,110
Total Costs to NRC	\$15,614	\$92,813	\$92,813
(Includes DOE Adder)			

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**Task 13 - Dynamic Structural Analyses in Support of Risk-Informing
10 CFR Part 71**

1. Financial Summary

PNNL Available Funding (Adjusted: Reflects DOE Adder Initiated in FY92)

<u>Authorized</u> <u>Cost Ceiling</u>	<u>Funding</u> <u>Obligation</u>	<u>Period Costs</u>	<u>Total</u> <u>Costs to Date</u>	<u>Cumulative</u> <u>Percent Spent</u>
\$194,175	\$48,544	\$788	\$788	1.6%

NRC Funding Provided to DOE

<u>Authorized</u> <u>Cost Ceiling</u>	<u>Funding</u> <u>Obligation</u>	<u>Period Costs</u>	<u>Total</u> <u>Costs to Date</u>	<u>Cumulative</u> <u>Percent Spent</u>
\$200,000	\$50,000	\$812	\$812	1.6%

2. Task Cost Status:

	<u>Current</u> <u>Month</u>	<u>Fiscal</u> <u>Year to Date</u>	<u>Cumulative</u> <u>To Date</u>
Direct Staff Labor Hours	6.5	6.5	6.5
Labor	\$788	\$788	\$788
Travel Expenses	0	0	\$0
Service Equipment Centers	0	0	\$0
Other Intermediate Costs	0	0	\$0
Value Added Overheads	0	0	\$0
Services - Other RL Contractors	0	0	\$0
Procurements	0	0	\$0
Subcontracts	0	0	\$0
Total PNNL Costs	<u>\$788</u>	<u>\$788</u>	<u>\$788</u>
Total Costs to NRC	<u>\$812</u>	<u>\$812</u>	<u>\$812</u>
(Includes DOE Adder)			

DATE

July 2002

NRC JOB CODE J5167

MONTHLY FORECAST VS ACTUAL - PNNL EXPENSE BY TASK

TASK #	TASK DESCRIPTION		Prior Years	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	FY03	TOTALS
13	Dynamic Structural Analyses in Support of... PROJECTED	NRC \$'s											15.2	15.2	19.7	150.0	200.0
		PNNL \$'s											14.7	14.7	19.1	145.6	194.2
13	Dynamic Structural Analyses in Support of... ACTUAL	NRC \$'s											0.8				0.8
		PNNL \$'s											0.8				0.8

TASK #	TASK DESCRIPTION		Prior Years	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	FY03	TOTALS
12	DEV OF ANALYSIS OF SF & RADIOACTIVE... PROJECTED	NRC \$'s								20.1	38.4	20.2	20.2	20.2	20.2	60.6	200.0
		PNNL \$'s								19.5	37.3	19.6	19.6	19.6	19.6	58.9	194.2
12	DEV OF ANALYSIS OF SF & RADIOACTIVE... ACTUAL	NRC \$'s								20.1	20.7	36.4	15.6				92.8
		PNNL \$'s								19.5	20.1	35.4	15.2				90.1

TASK #	TASK DESCRIPTION		Prior Years	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	FY03	TOTALS
11 Complete	THERMAL HYDRAULIC ANALYSIS PROJECTED	NRC \$'s	13.3	19.3	13.9	20.6	20.6	18.5	20.6	18.5	9.4						154.7
		PNNL \$'s	12.9	18.7	13.5	20.0	20.0	18.0	20.0	18.0	9.1						150.2
11 Complete	THERMAL HYDRAULIC ANALYSIS ACTUAL	NRC \$'s	13.3	19.3	20.1	27.7	9.2	0.8	16.8	6.4	0.0						113.6
		PNNL \$'s	12.9	18.7	19.5	26.9	9.0	0.7	16.3	6.2	0.0						110.2

TASK #	TASK DESCRIPTION		Prior Years	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	FY03	TOTALS
10 Complete	ADV NUHOMS THERMAL ANALYSIS PROJECTED	NRC \$'s	48.2	32.7	21.9	9.1	34.0	27.1	22.7	22.7	9.8	0.0	0.0	0.0	0.0		228.2
		PNNL \$'s	46.8	31.7	21.3	8.8	33.0	26.3	22.0	22.0	9.6	0.0	0.0	0.0	0.0		221.5
10 Complete	ADV NUHOMS THERMAL ANALYSIS ACTUAL	NRC \$'s	48.2	32.7	21.9	9.1	29.7	31.7	45.4	9.6	0.0	0.0	0.0				228.2
		PNNL \$'s	46.8	31.7	21.3	8.8	28.8	30.8	44.1	9.3	0.0	0.0	0.0				221.6

TASK #	TASK DESCRIPTION		Prior Years	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	FY03	TOTALS
09 Complete	CSFM PROJECTED	NRC \$'s	346.5	6.3	0.0	0.0	0.0	0.0	0.0								352.8
		PNNL \$'s	336.4	6.1	0.0	0.0	0.0	0.0	0.0								342.5
09 Complete	CSFM ACTUAL	NRC \$'s	346.5	7.2	-1.0	0.0	0.0	0.0	0.0								352.8
		PNNL \$'s	336.4	7.0	-0.9	0.0	0.0	0.0	0.0								342.5