

January 5, 2004

Mr. Lew W. Myers  
Chief Operating Officer  
FirstEnergy Nuclear Operating Company  
Davis-Besse Nuclear Power Station  
5501 North State Route 2  
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION  
SPECIAL INSPECTION REPORT NO. 05-346/03-24

Dear Mr. Myers:

On November 21, 2003, the U.S. Nuclear Regulatory Commission (NRC) completed a special inspection at your Davis-Besse Nuclear Power Station. The enclosed inspection report documents the inspection findings which were discussed with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, this inspection focused on the backlog of engineering and maintenance work that would not be performed until after restart of the plant. The inspection was an integral portion of the panel's review for Restart Checklist Item 5.b., "Systems Readiness for Restart." The checklist item remains open until further review during subsequent inspections. The inspection focused on a review of the licensee's process for tracking open backlog items, a review of the effectiveness of the process in justifying deferral of activities, an evaluation of the licensee's use of probabilistic risk assessment insights in deferring items to a post-restart status, and an evaluation of the potential risk implications of deferred items. The inspectors concluded that the restart scoping process was satisfactory and that the deferred actions did not individually or collectively have a risk significant impact on plant restart. However, continued management attention is needed to assure resources are committed to the post-restart backlog.

On the basis of the results of this inspection, no findings of significance were identified.

L. Myers

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Sincerely,

***/RA by John A. Grobe Acting for/***

John A. Grobe, Chairman  
Davis-Besse Oversight Panel

Docket No. 50-346  
License No. NPF-3

Enclosure: Inspection Report No. 05-346/03-24

cc w/encl: The Honorable Dennis Kucinich  
G. Leidich, President - FENOC  
Plant Manager  
Manager - Regulatory Affairs  
M. O'Reilly, Attorney, FirstEnergy  
Ohio State Liaison Officer  
R. Owen, Administrator, Ohio Department of Health  
Public Utilities Commission of Ohio  
President, Board of County Commissioners  
Of Lucas County  
Steve Arndt, President, Ottawa County Board of Commissioners  
D. Lochbaum, Union Of Concerned Scientists  
J. Riccio, Greenpeace  
P. Gunter, N.I.R.S.

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-346

License No: NPF-3

Report No: 05-346/03-24

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Davis-Besse Nuclear Power Station

Location: 5501 North State Route 2  
Oak Harbor, OH 43449-9760

Dates: November 17 - 21, 2003

Inspectors: M. Parker, Senior Reactor Analyst, RIII  
S. Burgess, Senior Reactor Analyst, RIII  
W. Schmidt, Senior Reactor Analyst, RI  
J. Rutkowski, Resident Inspector

Approved by: Christine A. Lipa, Chief  
Branch 4  
Division of Reactor Projects

Enclosure

## **SUMMARY OF FINDINGS**

IR 05-346/03-24(DRS); FirstEnergy Nuclear Operating Company; on 11/17-21/2003; Davis-Besse Station. Engineering and Maintenance Backlog inspection.

The report covers a one-week special inspection by three regional Senior Reactor Analysts and a resident inspector. The inspection assessed the potential risk impact of Davis-Besse's deferred/post-restart items prior to startup. The inspection focused on a review of the licensee's program/process for tracking backlogged open items, a review of the effectiveness of the program/process in justifying deferral of activities, an evaluation of the licensee's use of PRA insights in deferring items to post-restart status, and an evaluation of the potential risk implications of deferred items. No findings of significance were identified.

## REPORT DETAILS

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness**

#### 4OA5 Other Activities

##### .1 Review of Licensee's Program/Process for tracking backlogged open items

###### a. Inspection Scope

The inspectors examined backlogged items that were not scheduled to be completed prior to the expected plant restart for the following programs: Work Orders, Engineering Change Requests, Engineering Work Requests, Design Changes, Temporary Modifications, Operator Workarounds, Procedure Change Requests, Vendor actions, Request for Assistance, Updated Final Safety Analysis Report (UFSAR) changes, Preventative Maintenance, Condition Reports, and Corrective Actions. In addition to evaluating the impact of the maintenance and engineering backlog on individual systems, the inspectors screened backlog items for potential impact on initiating events and containment performance.

###### b. Observations

The inspectors noted that based on the licensee's Probabilistic Safety Assessment (PSA), the most likely core damage scenarios by initiating event type were associated with component cooling water malfunctions, loss of DC power, service water malfunctions, loss of offsite power, and loss of coolant accidents. Using these accident scenarios captured sequences that accounted for over 79% of the core damage frequency (CDF). In addition, the inspectors examined overall system contribution to CDF. The risk importance of many of the more highly ranked systems on the inspector's final list was influenced by their potential failure to mitigate these scenarios and their overall contribution to CDF. As a result, the inspectors selected backlog items related to 12 systems and the loss Component Cooling Water and Service Water initiating events for further review of their potential collective risk significance. These mitigating systems represented over 95% of the overall CDF contribution to the plant. These systems were: component cooling water, auxiliary feedwater, DC power, motor driven feedwater pump, service water, emergency diesel generator, station blackout emergency diesel generator, low pressure injection, 480 Volt alternating current, instrument air, service air, and high pressure injection.

###### Risk-Significance of Post-Restart Backlog

The post-restart backlog represented approximately 17,000 items tracked by the licensee. The inspectors noted that the maintenance backlog represented approximately 20% of the total backlog. However, the majority of the maintenance backlog consisted of elective maintenance activities. In reviewing the maintenance

backlog for the selected risk significant systems, the inspectors determined that the deferred backlog did not have a high risk significance. A large portion of the items represented duplication or redundant activities that had not been administratively closed out. Another large portion represented valve packing leaks identified from previous comprehensive system and containment walkdowns. Work orders were generated to address these issues where only minor cleaning resolved the issue. The majority of the remaining non-maintenance backlog consisted of engineering issues related to resolving condition reports and corrective actions.

The inspectors discussed backlogged items with system engineers to understand the details of the issues that were designated as post-restart. System engineers were knowledgeable of system design and outstanding deferred items since each system engineer was responsible for defending system restart readiness in the System Health Report and during System Health Report for Restart Expectations meetings. The inspectors attended a system health report meeting for the Auxiliary Feedwater, Service Water, Instrument Air, Low Pressure Injection, and High Pressure Injection.

The inspectors also discussed backlogged items with plant management; specifically, with design engineering, plant engineering, work planning, and operations to understand their perspective and understanding of the overall impact of the post-restart backlog. The managers were knowledgeable of outstanding deferred items and their overall cumulative impact.

Discussions with system engineers, observation of a system health report meeting, review of Probabilistic Safety Assessment groups Risk Evaluation of Plant Material Condition Backlog report, and a detailed evaluation of the backlogged items assured the inspectors that the restart scoping process was satisfactory and deferred action did not individually or collectively have a risk-significant impact on the unit restart.

### Configuration Control

The inspectors identified that a large amount of the backlog consisted of drawing changes, calculations, procedure change requests, condition reports, corrective actions, UFSAR, engineering change requests, and work orders. In reviewing the issues individually, the inspectors determined that the licensee appropriately categorized the issues as post-restart; however, a significant amount of the backlog had no target completion date other than a default post-restart date. The inspectors were not able to identify that the licensee had performed any assessment of the integrated impact of the engineering backlog other than to identify the issues as post-restart. The combined integrated effect of the backlog could ultimately have an effect in the licensee's ability to appropriately address issues in a timely manner. System engineers, maintenance planners, maintenance workers and operators routinely utilize these documents to conduct activities and would continue to use these documents without the knowledge that the documents may not have been updated. Overall, the large backlog of engineering issues could potentially have an impact on continued operation of the facility. In discussing these issues with the licensee, the licensee indicated to the inspectors that they would be assigning target completion dates for these activities and were in the process of developing a program to reduce the backlog.



c. Conclusions

Detailed review of the backlogged items, review of self assessments, discussions with system engineers, management discussions, and system health meetings concerning the post-restart backlog, assured the inspectors that the restart scoping process was satisfactory and deferred actions did not individually or collectively have a risk-significant impact on plant restart. However, continued management attention was needed to assure resources are committed to addressing the post-restart backlog.

No findings of significance were identified.

.2 Evaluation of the licensee's Use of PSA Insights in Deferring Items to Post Re-Start

a. Inspection Scope

The team evaluated the licensee's use of PSA insights relating to the backlog of open work requests. Specifically the team reviewed a detailed risk evaluation of plant material condition backlog items in a report dated November 4, 2003, completed by the licensee's PSA group. The team also reviewed the tracking of modification activities that would require updating of the PSA to reflect actual plant conditions/operation.

b. Observations

The team found that the risk analysis was well prepared and provided a very detailed account of the elective and corrective maintenance backlog on the most risk significant systems. This assessment used overall conservative bounding values with respect to the potential affects of the known equipment backlog deficiencies on both initiating event frequencies and equipment mitigation capabilities. The team found the licensee's assessment conservative and represented a very low increase in CDF.

Relative to PSA updating following modification, the team found that the design control process specified the issuance of a condition report if a modification could affect the PSA. The condition reports were then reviewed by the PSA staff to determine the need for a PSA update. In some cases the condition report was issued long before the modification was actually installed and used as a tracking mechanism. The team noted that recent modifications to the high pressure injection system did not require an update to the PSA, because the modifications were restoring the systems to conditions already assumed in the PSA.

a. Conclusions

The licensee had completed a detailed conservative analysis which indicated only a small increase in plant risk considering the backlog of maintenance items at startup.

No findings of significance were identified.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. Lew Myers, and other members of licensee management at the conclusion of the inspection on November 21, 2003. The NRC inspectors asked the licensee whether any materials discussed as potential report material should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee Personnel

L. Myers, Chief Operating Officer, FENOC  
J. Hagan, Senior Vice President, FENOC  
M. Bezilla, Site Vice President  
B. Boles, Manager, Plant Engineering  
K. Byrd, Supervisor, Design Engineering  
G. Dunn, Manager, Work Management  
J. Grabnar, Manager, Design Engineering  
D. Gudger, Supervisor, Regulatory Affairs  
R. Hovland, Supervisor, Plant Engineering  
S. Loehlein, Manager, Nuclear Quality Assurance  
W. Marini, Regulatory Affairs  
K. Ostrowski, Manager, Regulatory Affairs  
J. Powers, Director, Nuclear Engineering  
M. Roder, Manager, Plant Operations  
R. Schrauder, Director, Support Services  
M. Stevens, Director, Maintenance  
C. Gale, EDG System Engineer  
D. Duquette, 4160V System Engineer  
M. Roelant, 480V System Engineer  
C. Henge, CCW System Engineer

## LIST OF DOCUMENTS REVIEWED

### Work Orders:

2000-02971	200001003	200004674	200007151
2000-03252	200001235	200004699	200007232
2000-03308	200001329	200004741	200007318
2000-03427	200001426	200004818	200007361
2000-03452	200001607	200004847	200007515
2000-03687	200001680	200005044	200007521
2000-03736	200001691	200005100	200007526
2000-04770	200001944	200005116	200007530
2000-04954	200001957	200005201	200007603
2000-04991	200001964	200005208	200007712
2000-05899	200001972	200005209	200007724
2000-05899	200002012	200005231	200007801
2000-06308	200002151	200005285	200007803
2000-06618	200002352	200005315	200007816
2000-45692	200002358	200005328	200007825
2000-06664	200002448	200005329	200007877
2000-07992	200002487	200005335	200007887
2000-08027	200002501	200005343	200007910
2000-08304	200002536	200005347	200007923
2000-08856	200002564	200005777	200007993
2000-08857	200002575	200005851	200008067
2000-08861	200002700	200006062	200008261
2000-08909	200002772	200006108	200008422
2000-08921	200002817	200006174	200008423
2000-08922	200002896	200006213	200008440
2000-10544	200003012	200006255	200008441
2000-11213	200003035	200006341	200008455
2000-36177	200003092	200006353	200008509
2000-39187	200003123	200006360	200008518
2000-48951	200003127	200006410	200008584
2000-55174	200003226	200006477	200008649
2000-57137	200003263	200006479	200008664
200000086	200003281	200006501	200008724
200000167	200003419	200006514	200008725
200000180	200003446	200006529	200008737
200000193	200003644	200006541	200008740
200000458	200003648	200006563	200008750
200000489	200003694	200006574	200008751
200000521	200003727	200006622	200008897
200000540	200003815	200006677	200008914
200000558	200004367	200006739	200009012
200000739	200004419	200007104	200009046
200000750	200004510	200007105	200009047
200000757	200004554	200007131	200009197
200000791	200004596	200007137	200009217
200000977	200004644	200007150	200009224

200009356	200045361	200056634	200060657
200009401	200045370	200056845	200060658
200009407	200045588	200057865	200060659
200009410	200045635	200059407	200060660
200009458	200045638	200059523	200060661
200009580	200045639	200059540	200060663
200009757	200045657	200059550	200060664
200009772	200047259	200059580	200060665
200009808	200047423	200059584	200060666
200009852	200047671	200059848	200060667
200009888	200048364	200059857	200060810
200009992	200048467	200059860	200060876
200010024	200048877	200060091	200060877
200010025	200048878	200060129	200060878
200010040	200048953	200060560	200060879
200010358	200049115	200060561	200060880
200010414	200049138	200060586	200060882
200010481	200053497	200060588	200062024
200010516	200053498	200060589	200062122
200010527	200053499	200060590	200063022
200010548	200053500	200060591	200063033
200011379	200053501	200060592	200063034
200011491	200053502	200060593	200063649
200011530	200053503	200060594	200063670
200011672	200053506	200060595	200063955
200011875	200053507	200060596	200064415
200011940	200053510	200060597	200064853
200011977	200053511	200060598	200065024
200012185	200053512	200060599	200065060
200012191	200053513	200060600	200065883
200012241	200053515	200060601	200066473
200012306	200053516	200060602	200066665
200012351	200053527	200060603	200066799
200034015	200053693	200060604	200067016
200037962	200053748	200060605	200067202
200038794	200054374	200060606	200067203
200039190	200054375	200060607	200067204
200040002	200054390	200060608	200067205
200041841	200054704	200060634	200067207
200041969	200055194	200060652	200068374
200041985	200055269	200060653	200068375
200044877	200055368	200060654	200068378
200044954	200055369	200060655	
200045149	200056066	200060656	

Engineering Change Requests:

01-0015-00	01-0105-00	02-0169-00	02-0627-00
01-0071-00	01-0173-00	02-0372-00	02-0809-00
01-0072-00	01-0410-00	02-0570-00	02-0809-01

02-0834-00	03-0018-00	03-0085-00	03-0409-00
02-0291-00	03-0041-00	03-0099-00	03-0410-00
02-0300-00	03-0066-00	03-0101-01	03-0421-00
02-0381-00	03-0143-00	03-0105-00	03-0436-00
02-0505-00	03-0183-00	03-0116-00	03-0438-00
02-0547-00	03-0216-00	03-0121-00	03-0444-00
02-0563-00	03-0216-01	03-0136-00	03-0454-00
02-0586-00	03-0251-00	03-0141-00	03-0458-00
02-0605-00	03-0265-00	03-0151-00	03-0483-00
02-0643-00	03-0311-00	03-0170-00	03-0505-00
02-0644-00	03-0312-00	03-0174-00	03-0507-00
02-0665-00	03-0340-00	03-0183-00	03-0513-00
02-0684-00	03-0345-00	03-0220-00	03-0516-00
02-0707-00	03-0411-00	03-0230-00	03-0517-00
02-0720-00	03-0448-00	03-0250-00	03-0520-00
02-0731-00	03-0471-00	03-0275-00	03-0532-00
02-0774-00	03-0503-00	03-0284-00	03-0533-00
02-0788-00	03-0474-00	03-0287-00	03-0533-01
02-0791-00	03-0540-00	03-0298-00	03-0546-00
02-0818-00	03-0572-00	03-0319-00	03-0561-00
02-0829-00	03-0620-00	03-0321-00	03-0579-00
02-0850-00	03-0072-00	03-0328-00	03-0610-00
02-0858-00	03-0073-00	03-0335-00	
02-0858-01			

Engineering Work Requests:

00-0049-00	01-0073-00	01-0306-01	02-0064-00
01-0001-00	01-0093-00	01-0314-00	02-0091-00
01-0050-00	01-0118-00	01-0345-00	02-0129-00
01-0053-00	01-0175-00	01-0358-00	02-0150-00
01-0139-00	01-0186-00	01-0365-00	02-0151-00
01-0145-00	01-0216-00	01-0367-00	02-0188-00
01-0176-00	01-0224-00	01-0401-00	02-0196-00
01-0282-00	01-0262-00	01-0402-01	02-0197-00
01-0470-00	01-0262-00	01-0403-00	02-0252-00
01-0471-00	01-0262-01	01-0446-00	02-0338-00
01-0483-00	01-0264-00	01-0469-00	02-0345-00
01-0010-00	01-0298-00	02-0161-00	02-0356-00
01-0054-00	01-0306-00	02-0054-00	02-0379-00

Engineering Replacement Review:

60-0003-140	60-0001-258	60-0003-139	60-0003-140
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Condition Reports:

01-01508	02-05244	02-08254	03-01035
01-01623	02-05347	02-08314	03-02103
01-02532	02-05402	02-08342	03-02353
02-03889	02-05613	02-08923	03-02614
02-04488	02-05746	02-08925	03-03250
02-04539	02-06191	02-08929	03-03404
02-05181	02-06224	02-08931	03-03473
02-05541	02-06441	02-08937	03-03618
02-01807	02-06830	02-09171	03-04422
02-02120	02-06835	03-01725	03-04473
02-02343	02-06983	03-02033	03-05156
02-02892	02-07010	03-05138	03-05638
02-04227	02-07247	03-00055	03-05873
02-04388	02-07248	03-00515	03-05898
02-04538	02-07294	03-00517	03-05984
02-04546	02-07491	03-00518	03-06501
02-04697	02-07516	03-00614	03-06845
02-04715	02-07702	03-00617	03-07004
02-05081	02-08005	03-00831	03-07157
02-05215	02-08246	03-00866	03-07443

Action Vendor Correspondence Tracking:

03-1063	00-0379	EXT-97-01105	03-1057
00-0348	03-0213		

Request for Assistance:

02-0195	99-0229	02-0233	02-0159
00-0291	02-0154	01-0155	02-0267
00-0307	03-0009	00-0280	00-0296
02-0037	02-0155	02-0247	

Modifications:

97-0021-00	98-063-00	99-0025-00	08-0009-00
98-0062-00	87-1040-00		

## LIST OF ACRONYMS USED

ADAMS	Agency-wide Document Access and Management System
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
DC	Direct Current
DRS	Division of Reactor Safety
FENOC	FirstEnergy Nuclear Operating Company
IR	Inspection Report
NRC	Nuclear Regulatory Commission
PARS	Publically Available Records System
PSA	Probabilistic Safety Assessment
UFSAR	Updated Final Safety Analysis Report