50-346

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 4, 1998

Mr. John K. Wood
Vice President - Nuclear, Davis-Besse
Centerior Service Company
c/o Toledo Edison Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1 - INTERPRETATION OF SCHEDULE REQUIREMENTS FOR TECHNICAL SPECIFICATION SURVEILLANCE TESTS CONDUCTED ON A STAGGERED TEST BASIS (TAC NO. MA0163)

Dear Mr. Wood:

This document has been prepared in response to your letter (enclosed) dated November 3, 1997, in which you requested the Nuclear Regulatory Commission (NRC) staff to provide an interpretation of schedule requirements for Technical Specification (TS) surveillance tests conducted on a staggered test basis at the Davis-Besse Nuclear Power Station.

Background

Davis-Besse TS 1.0, "Definitions," defines staggered test basis as follows:

> STAGGERED TEST BASIS
>
> 1.21 A STAGGERED TEST BASIS shall consist of:
>
> a. A test schedule for n systems, subsystems, trains or designated components obtained by dividing the specified test interval into n equal subintervals,
>
> b. The testing of one system, subsystem, train or designated components at the beginning of each subinterval.

Davis-Besse TS 4.0.2 states:

> 4.0.2 Each Surveillance Requirement [SR] shall be performed within the specified time interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

TS Basis 4.0.2 states, in part:

> 4.0.2 The provisions of this specification provide allowable tolerances for performing surveillance activities beyond those specified in the nominal surveillance interval. ...It is not intended that the allowable tolerance be used as a convenience to repeatedly schedule the performance of surveillances at the allowable tolerance limit.

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Request for Interpretation

You requested an interpretation from NRC on the appropriate application of the 25 percent maximum allowable extension (TS 4.0.2) to TS surveillance testing perfo..ed on a staggered test basis.

Interpretation

As an example, consider a 4-channel system with channel functional testing required to be performed once per 32 days on a staggered test basis (32 days chosen for mathematical simplicity). Per TS 1.21:

Subinterval = 32/4 = 8 days

If a functional test is not performed within the 8 days, then TS 4.0.2 allows up to a 25 percent extension. In your letter, you offered two possible interpretations of the application of TS 4.0.2:

(1) Since each channel must be tested once per 32 days, then TS 4.0.2 allows:

Extension = 0.25 * 32 = 8 days

(2) Since each subinterval requires testing each 8 days, then TS 4.0.2 allows:

Extension = 0.25 * 8 = 2 days.

For the Davis-Besse TSs, the staff has determined that the 25 percent extension of TS 4.0.2 addresses the overall length of the surveillance interval, while the subintervals of the staggered testing definition only deal with how the beginning of the overall intervals for different subsystems are arranged. Therefore, TS 4.0.2 should be applied to the overall interval requirement. Thus, as in the example above,

Extension = 0.25 * 32 = 8 days.

You also state in your letter that:

> ...the intent of performing testing on a staggered basis is to limit the length of time that a common cause system failure could go undetected.

Though staggered testing does have a benefit with regard to reducing the risk due to common cause failures, it also provides for operational convenience. The requirement in the Davis-Besse TSs to perform designated testing on a staggered basis (each 8 days in the example above) does not take precedence over each system-specific surveillance requirement to test all channels within the specified interval (32 days in the example).

Since TS 4.0.2 cannot be used on a routine basis, a test (say, on Channel 2) conducted subsequent to the application of TS 4.0.2 would still have to be performed again in the next subinterval as previously scheduled (for Channel 2). For example, if the entire 8-day extension was utilized for the test of Channel 2, then the next test of that channel would have to be performed in 24 days, as shown by the following table:

Day	Channel
8	1 completed (normal schedule)
16	(2 scheduled, not completed, TS 4.0.2 invoked)
24	2 completed (including TS 4.0.2 25 percent extension) 3 completed (normal schedule)
32	4 completed (normal schedule)
40	1 completed (normal schedule)
48	2 completed (return to normal schedule)
56	3 completed (normal schedule) ....

The above interpretation applies to Davis-Besse. For plants that have opted the improved Standard Technical Specifications (iSTS), SR 3.0.2 (which provides for a 25 percent extension similar to Davis-Besse TS 4.0.2) specifically refers to the frequency which, due to the changed definition of staggered testing in iSTS, is the subinterval. Therefore, the above interpretation does not apply to plants that have adopted the iSTS.

Please contact Allen Hansen of my staff at 301-415-1390 if you have any questions.

Sincerely,

Douglas V Pickett for

Richard P. Savio, Acting Project Director
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure: As stated

cc: See next page

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Sincerely,

Original signed by D. Pickett for:
Richard P. Savio, Acting Project Director
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

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OFFICE	PD33:LA	C	PD33:PM		HICB:BC		TSB:BC		PD33:PD	
NAME	EBarnhill	EB	AHansen		JWermiel *		WBeckner	WB	RSavio	
DATE	2/3/98		2/3/98		1/27/98		2/4/98		2/4/98	

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Please contact Allen Hansen of my staff at 301-415-1390 if you have any questions.

Sincerely,

Original signed by D. Pickett for:
Richard P. Savio, Acting Project Director
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Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

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OFFICE	PD33:LA	C	PD33:PM		HICB:BC		TSB:BC		PD33:PD	
NAME	EBarnhill	EB	AHansen		JWermiel *		WBeckner	WDB	RSavio	RPS
DATE	2/3/98		2/3/98		1/27/98		2/4/98		2/4/98	

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cc:

Mary E. O'Reilly
Centerior Energy Corporation
300 Madison Avenue
Toledo, OH 43652

James L. Freels
Manager - Regulatory Affairs
Toledo Edison Company
Davis-Besse Nuclear Power Station
5501 North State - Route 2
Oak Harbor, OH 43449-9760

Gerald Charnoff, Esq.
Shaw, Pittman, Potts
and Trowbridge
2300 N Street, NW.
Washington, DC 20037

Regional Administrator
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, IL 60523-4351

Robert B. Borsum
Babcock & Wilcox
Nuclear Power Generation Division
1700 Rockville Pike, Suite 525
Rockville, MD 20852

Resident Inspector
U.S. Nuclear Regulatory Commission
5503 North State Route 2
Oak Harbor, OH 43449

James H. Lash, Plant Manager
Toledo Edison Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, OH 43449-9760

Roy P. Lessy, Jr.
Akin, Gump, Strauss, Hauer & Feld, LLP
1333 New Hampshire Ave., NW., Ste. 400
Washington, DC 20036

Robert E. Owen, Chief
Bureau of Radiological Health
Service
Ohio Department of H[illegible]
P.O. Box 118
Columbus, OH 43266-0118

James R. Williams, Chief of Staff
Ohio Emergency Management Agency
2855 West Dublin Granville Road
Columbus, OH 43235-2206

Donna Owens, Director
Ohio Department of Commerce
Division of Industrial Compliance
Bureau of Operations & Maintenance
6606 Tussing Road
P.O. Box 4009
Reynoldsburg, OH 43068-9009

Ohio Environmental Protection Agency
DERR--Compliance Unit
ATTN: Zack A. Clayton
P.O. Box 1049
Columbus, OH 43266-0149

State of Ohio
Public Utilities Commission
180 East Broad Street
Columbus, OH 43266-0573

Attorney General
Department of Attorney
30 East Broad Street
Columbus, OH 43216

President, Board of County
Commissioner of Ottawa County
Port Clinton, OH 43252

CENTERIOR ENERGY

5501 N. State Route 2
Oak Harbor, OH 43449

419-249-2300
FAX: 419-321-8337

John K. Wood
Vice President - Nuclear
Davis-Besse

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Docket Number 50-346

November 3, 1997

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555-0001

Subject: Request for Interpretation of Schedule Requirements Regarding Technical Specification Surveillance Tests Conducted on a Staggered Test Basis

Ladies and Gentlemen:

The purpose of this letter is to request an NRC interpretation of schedule requirements regarding Technical Specification surveillance tests conducted on a "Staggered Test Basis" for the Davis-Besse Nuclear Power Station (DBNPS), Unit Number 1, Operating License Number NPF-3. The details of this request are provided in the Enclosure. A response is requested by June 1, 1998.

Should you have any questions or require additional information, please contact Mr. James L. Freels, Manager - Regulatory Affairs, at (419) 321-8466.

Very truly yours,

MKL/laj

Enclosure

cc: A. B. Beach, Regional Administrator, NRC Region III
S. J. Campbell, DB-1 NRC Senior Resident Inspector
A. G. Hansen, DB-1 NRC/NRR Project Manager
Utility Radiological Safety Board

Enclosure

Request for Interpretation
of
Schedule Requirements Regarding Technical Specification Surveillance Tests
Conducted on a Staggered Test Basis

Background:

The Davis-Besse Nuclear Power Station (DBNPS) Technical Specifications (TS) Definition 1.21 states as follows:

> A STAGGERED TEST BASIS shall consist of:
>
> a. A test schedule for n systems, subsystems, trains or designated components obtained by dividing the specified test interval into n equal subintervals,
>
> b. The testing of one system, subsystem, train or designated components at the beginning of each subinterval.

There are no TS Bases associated with the Definitions Section of TS, however, the intent of performing testing on a staggered basis is to limit the length of time that a common cause system failure could go undetected.

Section 4.0.2 of the DBNPS TS states as follows:

> Each Surveillance Requirement shall be performed within the specified time interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

The associated Bases for DBNPS TS Section 4.0.2 states, in part:

> The provisions of this specification provide allowable tolerances for performing surveillance activities beyond those specified in the nominal surveillance interval. These tolerances are necessary to provide operational flexibility because of scheduling and performance considerations. The phrase "at least" associated with a surveillance frequency does not negate this allowable tolerance value and permits the performance of more frequent surveillance activities.
>
> The allowable tolerance for performing surveillance activities is sufficiently restrictive to ensure that the reliability associated with the surveillance activity is not significantly degraded beyond that obtained from the nominal specified interval. It is not intended that

the allowable tolerance be used as a convenience to repeatedly schedule the performance of surveillances at the allowable tolerance limit.

Explanation of Issue:

The issue of interpretation is how to apply the maximum allowable extension provisions of TS Section 4.0.2 to surveillance testing conducted on a STAGGERED TEST BASIS. To illustrate the issue, assume a typical four channel instrumentation functional unit, with channel functional testing required to be performed at least once per 31 days on a STAGGERED TEST BASIS.

Using the above example, under TS Definition 1.21, the 31 day specified test interval is divided into four equal subintervals of 7.75 days, and one channel is tested at the beginning of each subinterval. As a practical matter, at the DBNPS, such a channel functional test would typically be scheduled once a week on the same day of the week, with each channel being tested every 4 weeks. In the event that the channel functional test schedule is disrupted, for whatever reason, and it becomes necessary for the provisions of Specification 4.0.2 to be applied, there are differing interpretations as to how this should be done.

One interpretation is that the 25% allowance must be applied to the subinterval time frame. Under this interpretation, if last week's channel functional test (for channel "x") was completed at arbitrary time "zero", then this week's channel functional test (for channel "y") must be completed no later than 125% of the 7.75 day subinterval, or by day 9.6875.

A differing interpretation is that the 25% allowance may be applied to the 31 day interval for the particular channel of interest, irrespective of the test completion history for the other channels. Under this interpretation, the maximum allowable extension for any channel is 125% of 31 days, or 38.75 days from the last performance of the channel functional test for that same channel.

The first interpretation ensures that if the channel "y" test is completed at day 9.6875, that time will be within 125% of 31 days since the last performance of the channel "y" test, even if each test in the past month utilized the 25% allowance. This method also ensures a relatively uniform test spacing over the 31 day interval, regardless of whether the 25% allowance is used. However, this method is potentially overly conservative in the sense that if each of the three previous channels were completed on the normal 7 day schedule, and the need arose to use the maximum 9.6875 day allowance for channel "y", then channel "y" testing would be required to be completed within 30.6875 days (3 x 7 + 9.6875 days) of the last performance of the channel "y" test. Or, if each of the three previous channels were completed on a 7.75 day schedule, and the need arose to use the maximum 9.6875 day allowance for channel "y", then channel "y" testing would be required to be completed within 32.9375 days (3 x 7.75 + 9.6875 days) of the last performance of the channel "y" test. In either case, the current channel "y" test would be required to be completed well within the 38.75 day limit, were the extension applied to the 31 day interval, as would be allowed by the second interpretation. The end result is that, under the

first interpretation, a channel may need to be declared inoperable and placed in a tripped condition earlier than under the second interpretation. This could place the plant in a less reliable configuration since under a typical 2 out of 4 actuation logic, a spurious signal in a second channel could cause inadvertent initiation of a protective action, for example a reactor trip or a Safety Features Actuation System actuation.

However, while the second interpretation potentially allows a greater time margin to perform a test, it does not ensure that testing is uniformly spaced. Under the above example, a series of channel functional tests for each of four channels could be conducted with three 7 day subintervals and one 17.75 day subinterval.

Request for Interpretation:

The DBNPS surveillance test program is presently being conducted under the more conservative scheduling approach of applying the 25% maximum allowable extension of TS Section 4.0.2 to the STAGGERED TEST BASIS subinterval. However, as described above, this approach may be overly conservative and could result in equipment being prematurely declared inoperable, potentially placing the plant in a less reliable condition.

For this reason, the DBNPS requests a written response from the NRC on the appropriate application of the 25% maximum allowable extension of TS Section 4.0.2 to TS surveillance testing performed on a STAGGERED TEST BASIS.