

March 15, 1996

MEMORANDUM TO: Chairman Jackson
 Commissioner Rogers
 Commissioner Dicus

FROM: James M. Taylor
 Executive Director for Operations

SUBJECT: INTERNATIONAL NUCLEAR EVENT SCALE (INES) RATING FOR THE ICE
 BUILD UP EVENT AT WOLF CREEK

Original signed by
James M. Taylor

The Wolf Creek ice build up event of January 30, 1996 has been rated as a level two using the International Nuclear Event Scale (INES) methodology. This is the highest rating assigned to an event in the United States since our limited participation in INES began in 1993. A level two event on the INES scale is indicative of "significant failures in safety provisions but with sufficient defense in depth remaining to cope with additional failures." The event rating form will be transmitted to the International Atomic Energy Agency and the licensee, and is included here as Attachment 1.

The NRC's limited participation in the INES normally involves assigning an INES rating level between zero and seven for licensee declared emergencies at the Alert level or above. Although this Wolf Creek event was only declared as an Unusual Event by the licensee, an NRC Augmented Inspection Team (AIT) found that the event should have been declared as an Alert.

A summary of previous United States events rated under the INES is included as Attachment 2. A total of 19 events have been rated since the NRC began participating in this system. Prior to this event, the highest INES rating assigned to an event in the United States was level one.

Attachments: As stated

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THE INTERNATIONAL NUCLEAR EVENT SCALE (INES)

EVENT RATING FORM (ERF)

TO BE SENT TO THE IAEA INES CO-ORDINATOR BY

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EVENT TITLE	PARTIAL LOSS OF ESSENTIAL SERVICE WATER DUE TO FRAZIL ICE ON INTAKE TRASH RACKS						EVENT DATE	30.01.96				
RATING	RATING DATE	OUT OF SCALE	BELOW SCALE	ON SCALE				SAFETY ATTRIBUTE	DEGR. DEFENCE IN-DEPTH			
PROVISIONAL <input type="checkbox"/>	15.02.96			0	1	2	3	4	5	6	7	ON-SITE IMPACT
FINAL <input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>								
COUNTRY	USA	FACILITY NAME	WOLF CREEK GENERATING STATION						FACILITY TYPE	PWR		

ASPECTS OF SIGNIFICANCE TO THE PUBLIC:

	YES	NO
ACCIDENT <input type="checkbox"/>		
INCIDENT <input checked="" type="checkbox"/>		
DEVIATION <input type="checkbox"/>		
- RADIOACTIVE RELEASES OFF-SITE	<input type="checkbox"/>	<input checked="" type="checkbox"/>
- RADIOACTIVE RELEASES ON-SITE	<input type="checkbox"/>	<input checked="" type="checkbox"/>
- WORKERS INJURED BY RADIATION	<input type="checkbox"/>	<input checked="" type="checkbox"/>
- WORKERS INJURED PHYSICALLY	<input type="checkbox"/>	<input checked="" type="checkbox"/>
- PLANT SAFETY IS UNDER CONTROL	<input checked="" type="checkbox"/>	<input type="checkbox"/>
- THE EVENT REPORTED IS A DISCOVERY OF A DEFICIENCY BY ROUTINE SURVEILLANCE	<input type="checkbox"/>	<input checked="" type="checkbox"/>
- A PRESS RELEASE WAS MADE (IF YES, PLEASE ATTACH IT)	<input checked="" type="checkbox"/>	<input type="checkbox"/>

SHORT DESCRIPTION OF THE EVENT: Shortly before 0300 EST, on 30 January 1996, operators at the Wolf Creek Generating Station received indication of decreasing water levels in the Circulating (CW) and Service (SW) Water pump intake structure and started both Essential Service Water (ESW) pumps. The decrease in water level was caused by the formation of ice on the intake travelling screens. At 0437 operators manually tripped the reactor from 80% power in anticipation of the need to trip the CW pumps. Following reactor trip, five control rods failed to fully insert, (10 to 29 cm out). This failure to fully insert did not directly affect the event, but it did complicate the operators' response. Decay heat was removed through the steam generators using the atmospheric relief valves with feed from the Auxiliary Feedwater pumps. At 0614 the Turbine-driven Auxiliary Feedwater pump was secured and declared inoperable due to a shaft gland leak. At 0847 the "A" ESW pump was secured due to low ESW pump intake level caused by the formation of "frazil" ice below the surface of the water on the intake trash rack. Although the "B" ESW train remained in operation throughout the event, there were several occasions when the "B" ESW pump intake water level decreased to a level that threatened to render this pump inoperable as well.

JUSTIFICATION OF THE RATING: The manual reactor trip and loss of the Main Condenser following the imminent loss of the Circulating Water pumps resulted in initiation of the safety related Auxiliary Feedwater System. Core cooling with the Motor-driven Auxiliary Feedwater

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PLEASE ATTACH ADDITIONAL INFORMATION ON JUSTIFICATION OF THE EVENT RATING AND DIFFICULTIES ENCOUNTERED, IF NEEDED

JUSTIFICATION OF THE RATING: (Continued)

pumps (after the turbine-driven auxiliary feedwater pump was declared inoperable) was dependent upon either the ESW system (provides emergency diesel generator cooling) or offsite power. Offsite power remained available through the event. The "B" ESW train and one SW pump remained in operation throughout the event. The SW pump could also have been used to supply ESW loads. In addition, the plant had sufficient make-up inventory and a diesel driven fire pump that could have been used to feed the steam generators if necessary. Based on Severity Classification Criteria for Degradation of Defense in Depth with an Initiator (Table II), this event would be rated a Level 1/2. However, there are additional factors that were considered. Taken together, these additional factors justify rating the event as a Level 2. The first additional factor was the common cause failure potential introduced by the "frazil" ice phenomena. The second factor was that a control room operator did not align the ESW System in accordance with the operating procedure which resulted in a decrease in flow through the ESW pump intake structure warming lines. This decrease in warming flow was a contributor to the loss of the "A" ESW train and the potential loss of the "B" ESW train due to "frazil" ice buildup on the trash racks early that morning.

On-site and off-site impact criteria were not relevant for this event.

Summary of U.S. Events on the International Scale in 1993

Plant Name Type	Event Date	INES Level*	U.S. Emergency Classification	Event Description
Three Mile Island 1 PWR	2/7/93	Out of Scale	Site Area Emergency	Unauthorized intruder into plant protected area while operating at 100% power
Palo Verde 2 PWR	3/14/93	1	Alert	Steam generator tube rupture while operating at 99% power
Zion 2 PWR	3/15/93	Below Scale	Alert	Loss of Control Room Annunciators while operating at 100% power
Perry 1 PWR	3/26/93	Out of Scale	Alert	Main Service Water (non-safety-related) pipe break
North Anna 2 PWR	4/24/93	Below Scale	Alert	Excessive feedwater regulating valve oscillations cause water hammer induced vibration of the main feedwater piping
Robinson 2 PWR	8/16/93	Out of Scale	Alert	Minor fire on emergency diesel generator exhaust lagging
LaSalle 1 BWR	9/14/93	Below Scale	Alert	Loss of off-site power while operating at 100% power
Fermi 2 BWR	12/25/93	Out of Scale	Alert	Failure of low pressure turbine while operating at 93% power

Summary of U.S. Events on the International Scale in 1994

Plant Name Type	Event Date	INES Level*	U.S. Emergency Classification	Event Description
Waterford 3 PWR	3/19/94	Out of Scale	Alert	Toxic Gas Release near plant site
Salem 1 PWR	4/7/94	1	Alert	Plant Transient Induced s by debris in Circ Water System
Robinson 2 PWR	6/6/94	Out of Scale	Alert	Minor fire on Emergency Deisel Exhaust manifold

* Events are classified on a scale of seven levels. The lower levels (1-3) are termed incidents and the upper levels (4-7) accidents. Events which have no safety significance are classified as below scale/level 0 and are termed deviations. Events which have no safety relevance are termed "out of scale."

Summary of U.S. Events on the International Scale in 1995

Plant Name Type	Event Date	INES Level*	U.S. Emergency Classification	Event Description
Robinson 2 PWR	02/13/95	Out of Scale	Alert	Release of a toxic gas (Carbon Dioxide) in the auxiliary building
Waterford 3 PWR	03/25/95	Out of Scale	Alert	Ammonia release at a nearby chemical facility
Robinson 2 PWR	06/20/95	Below Scale	Alert	Reactor coolant system leakage in excess of 50 gallons per minute due to a charging pump relief valve failure
Waterford 3 PWR	07/20/95	Below Scale	Alert	Ammonia release at a nearby chemical facility
Salem 1 PWR	10/04/95	Below Scale	Alert	Loss of control room annunciators for greater than 15 minutes
LaSalle BWR	10/31/95	1	Alert	High radiation levels in containment due to over retraction of a traversing incore probe to an unshielded location

Summary of U.S. Events on the International Scale in 1996

Plant Name Type	Event Date	INES Level*	U.S. Emergency Classification	Event Description
Wolf Creek PWR	1/30/96	2	Unusual Event	Both trains of Essential Service Water were threatened by ice build up on the intake trash rack
Catawba PWR	2/6/96	1	Unusual Event	Loss of offsite power with one Emergency Diesel Generator out of service

* Events are classified on a scale of seven levels. The lower levels (1-3) are termed as incidents, and the upper levels (4-7) are termed as accidents. Events which have no safety significance are classified as below scale/level 0 and are termed as deviations. Events which have no safety relevance are termed as "out of scale."