

**Florida
Power**
CORPORATION

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File: 3-0-3-a-4

Mr. J. P. O'Reilly
Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Suite 3100
101 Marietta Street
Atlanta, GA 30303

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
IE Bulletin 80-05
VACUUM CONDITION RESULTING IN DAMAGE TO CHEMICAL VOLUME
CONTROL SYSTEM (CVCS) HOLDUP TANKS (SOMETIMES CALLED
'CLEAN WASTE RECEIVER TANKS')

Dear Mr. O'Reilly:

Enclosed is our response to I.E. Bulletin 80-05.

Please contact this office if you require any additional discussion
concerning our response.

Very truly yours,

FLORIDA POWER CORPORATION

P. Y. Baynard

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Manager
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Lobo(IE80-05)D46

cc: Director
NRC Office of Inspection and Enforcement
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I. INTRODUCTION

This submittal is in response to NRC Bulletin No. 80-05, which deals with the potential for vacuum conditions causing certain reactor coolant holdup tanks to rupture. All systems were reviewed to identify the tanks which can receive primary water, and to verify potential buckling problems which may result in the release of radioactive materials.

II. METHOD OF EVALUATION

Tanks falling within the scope of the bulletin were examined for existing buckling protection (vacuum breakers, vents, rupture discs, etc.). Tank strength was calculated using the 1979 ASME Boiler and Pressure Vessel Codes, Section ND-3133 (General Design Rules for Components Under External Pressure). The maximum potential vacuum conditions were then calculated (full tank contents drained with any valved vent lines assumed to be closed). These valves were then compared with the tank strength, and if a vacuum protection device exists, its adequacy was determined.

III. EXISTING CONDITIONS

Many of the tanks evaluated have vents which are normally open to the waste gas system. Under normal operating conditions these vents will protect the tanks from buckling.

IV. TANK CONDITIONS

NOTE: For all differential pressures, external pressure is greater than internal pressure.

Reactor Coolant Drain Tank - WDT-5

No buckling problems exist with this tank. The Reactor Coolant Drain Tank is structurally designed to withstand differential pressures to 55 psi. The maximum differential pressure created by draining the tank contents, with the vents closed (12 psi), will not cause damage to the tank.

Waste Neutralization Tank - WDT-9

The structural design of the Waste Neutralization Tank is such that it can withstand a differential pressure of 8.69 psi before buckling. This tank has a three inch overflow line, with a loop seal, directed to an open floor drain. A differential pressure of 4.4 psi will enable the tank to draw air through the loop seal, which will prevent the tank from buckling.

Demineralizers - WDDM-1A, 1B, 2A, 2B and MUDM-1A, 1B

The deborating, cation and makeup demineralizers can withstand differential pressures of 27.8, 27.8 and 25.7 psi, respectively, without buckling. Since the maximum differential pressure which is possible for this tank is less than 15 psi, there will be no problems with buckling.

Evaporators - WDEV-1, 2

The Reactor Coolant and Miscellaneous Waste Evaporators each contain some tanks. A rupture disc is used to protect these tanks from buckling if the differential pressure approaches 15 psi.

Reactor Coolant Bleed Tanks - WDT-3A, 3B, 3C

The three Reactor Coolant Bleed Tanks are designed to withstand a differential pressure of 4.6 psi. The tanks have a three inch overflow with a loop seal to an open floor drain. A differential pressure of 5.7 psi is needed to blow the seal and vent the tanks. A buckling problem could exist with these tanks.

Miscellaneous Waste Storage Tank - WDT-4

The Miscellaneous Waste Storage Tank can withstand a differential pressure of 4.6 psi. The tank has an overflow line with a loop seal which will vent to the atmosphere with a differential pressure of 4.4 psi. This will protect the tanks from buckling.

Concentrated Boric Acid, Concentrated Waste and Spent Resin Tanks - WDT-8A, 8B, 7A, 7B, and 6

None of these tanks can withstand a differential pressure over 2 psi. Overflow lines to open floor drains have loop seals which will blow at a differential pressure of 4.4 psi. A buckling problem could exist with all of these tanks.

Borated Water Storage Tank - DHT-1

The Borated Water Storage Tank is equipped with two vacuum breakers. The vacuum breakers vent the tank to the atmosphere if the differential pressure exceeds .25 psi. Each vacuum breaker is capable of admitting air fast enough to prevent tank buckling.

Make-up Tank - MUT-1

The Reactor Coolant Make-up Tanks can withstand a differential pressure of 23 psi. The maximum differential pressure which could exist is less than 15 psi. There will be no buckling problems with this tank.

V. CORRECTIVE ACTION

For those tanks which we indicate may have a buckling problem (see Table 1), as a corrective action, the following valves will be locked open to allow a pathway for makeup air. The valves, as identified below, are included in the CR-3 Surveillance Procedure SP-381 "Locked Valve List (Position Verification of Locked Valves)".

R. C. Bleed Tank 3A	WDV-337
R. C. Bleed Tank 3B	WDV-378
R. C. Bleed Tank 3C	WDV-379
Concentrated Boric Acid Tank 3A	WDV-416
Concentrated Boric Acid Tank 3B	WDV-417
Spent Resin Tank	WDV-851
Concentrated Waste Tank 3A	WDV-412
Concentrated Waste Tank 3B	WDV-415

TABLE I
VACUUM CONDITIONS IN TANKS

TAG NO.	TANK DESCRIPTION	DIFFERENTIAL PRESSURE LIMITATION (psi)	MAXIMUM DIFFERENTIAL PRESSURE (psi)	LOOP SEAL (feet)	VACUUM N ₂ -H ₂ PURGE (psig)	PROTECTION		CAN TANK BUCKLE?
						NORMALLY OPEN VENT TO	OTHER	
WDT-5	Reactor Coolant Drain Tank (1)	55	12	-	-	GRW Yes	-	No
WDT-3	Reactor Coolant Bleed Tanks (3)	4.7	5.7	13	-	Yes	-	Yes
WDT-4	Miscellaneous Waste Storage Tank (1)	4.7	4.4	10	-	Yes	-	No
WDT-8	Concentrated Boric Acid Tank (2)	1.7	4.4	10	-	Yes	-	Yes
WDT-9	Waste Neutralization Tank (1)	8.7	4.4	10	-	Yes	-	No
WDT-6	Spent Resin Tank (1)	1.9	4.4	10	-	Yes	-	Yes
WDT-7	Concentrated Waste Tank (2)	1.7	4.4	10	-	Yes	-	Yes
DHT-1	Borated Water Storage Tank (1)	-	.25	-	-	No	.25psi Vac. Brkrs.	No
WDEV-1	Reactor Coolant Evaporator (1)	>15	<15	5	100	Yes	Rupture disc <15psi	No
WDEV-2	Miscellaneous Waste Evaporator (1)	>15	<15	5	100	Yes	Rupture disc <15psi	No

TABLE I (Cont'd)

VACUUM CONDITIONS IN TANKS

TAG NO.	TANK DESCRIPTION	DIFFERENTIAL PRESSURE LIMITATION (psi)	MAXIMUM DIFFERENTIAL PRESSURE (psi)	LOOP SEAL (feet)	VACUUM N ₂ -H ₂ PURGE (psig)	PROTECTION		CAN TANK BUCKLE?
						NORMALLY OPEN VENT TO	OTHER	
WDDM-1	Deborating Demineral- izer (2)	27.8	<15	-	-	GRW No	-	No
WDDM-2	Cation Demineralizer (2)	27.8	<15	-	-	No	-	No
WUDM-1	Make-up and Purifi- cation Demineralizer (2)	25.7	<15	-	-	No	-	No
MUT-1	Reactor Coolant Make-up Tank (1)	23	<15	-	100 (N ₂) 50 (H ₂)	No	-	No