From: Joelle Starefos
To: Art Howell; David A Timm; Joseph Donoghue; Patrick Castleman; Robert Haag; Ron Lloyd; Russ Bywater; Thomas Koshy
Date: 7/25/02 4:39PM
Subject: DB LLRT List

Predecisional and ~~Sensitive Information~~

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Davis-Besse Lessons Learned Task Force Meeting

(7/24-25/2002)

~~*NRC PreDecisional*~~

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Using modified IAEA approach. Fact Level. What Level. Conclusion Level.

	a	**NRC failed to adequately assess symptomsof RCS leakage.**
12	A	CAC/Rad Monitor cleaning known by NRC through BC level
13	A	BA on head known by SRI during RFO12
16	A	RIII (Grant) knowledge of Rad Monitor
18	A	BCs logs on CAC/RMs & discussed in morning meetings
19	A	CAC cleaning observed by inspectors (DRS)
20	A	PM knew about CACs
22	A	DRP BC listed CAC cleaning (2001)
23	A	RIII didn't see CAC/RM cleaning as important
38	A	No one suggested NRC look at RCS leakage in containment during PIR
41	A	3 inspection reports discussing RMs without conclusions
52	A	RIII didn't view leakage as a problem
58	A	Multiple cleaning of CACs
76	A	No documentation of CAC evaluation inspection
77	A	No NRC doc of RM leak detection reliability insp.
83	A	No open items for CAC/RM or BA on head
87	A	Pzr safety valve mod increased leakage; NRC accepted without question
88	A	Assumed Pzr safety valve leakage was reason for CAC fouling
97	A	CR for CAC/RM not seen as safety-sig would be screened out
98	A	NRC Briefing package for Merrified didn't include BA problems
107	A	TS requirements for CAC/RM were relaxed

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118	A	BC didn't tell RI to pursue BA issues
125	A	RA knew of CAC issues
	b	**NRC failed to follow-up on Generic Communications.**
59	B	62001 not used for DB (precursor events)
61	B	62001 used 15 reactors (all RIV PWRs)
62	B	No insp followup of GL97-01
66	B	NRC followup for 88-05 audited 10 plants; DB acceptable
129	B	TI on BU2001-01 didn't address BA issues
132	B	2515 IP do not look at BA/GC followup
133	B	The old inspection program (9000 series) looked at OE issues
154	B	# of Generic Comm (NRC) not corrected with # of events
156	B	MD8.5 can't be followed because it hasn't been updated
160	B	No NRC programmatic guidance for effectiveness review of generic comm.
161	B	Sample/shotgun method for verification of generic comm implementation
164	B	IP62001 deleted w/o considering why it existed
165	B	NRC generated 17 boric acid generic communication
187	B	11/93 SER recommended inspection (visual) or leak detection system
189	B	11/93 SER recognized circumferential cracking, but didn't make recommendations
190	B	Staff action plan GL97-01 can't be found
201	B	GL97-01 closeout for DB based on generic info
202	B	DB was the only B&W licensee that didn't do inspections (ref GL97-01) NRC
232	B	1972 requested enhanced ISI for BA corrosion
	c	**NRC failed to understand implications of BA corrosion.**
14	C	Licensee stated that NRR knew about BA on head
15	C	SRI saw CR on BA on head
28	C	BA CRs not selected for PIR
29	C	Abbreviated version (issue) of BA CRs not represented
33	C	No apparent NRC followup of 96, 98 PCAQs
42	C	Aware of BA on RPV head and didn't inspect
43	C	SRI knew of flange leaks
45	C	Neither of Residents received training on BA
49	C	DRP BC and former SRI (only) knew of flange leaks
50	C	Flange leaks not pursued
65	C	1992 precursor insp no perf issues/no F/U of BA control prog
95	C	RIII saw RC-2 as a material control problem -vs- boric acid prog prob
105	C	NRC doesn't review owner's group input
116	C	BC/SRI/RI didn't observe RPV head videos

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128	C	RI reviewed CR/equivalent in some manner
130a	C	BA buildup not a safety issue by NRC
155	C	NUREG 6245 (CRDM crack) NRC not aware of B&W content
169	C	NRC 1993 SER addressed RVH nozzle cracks as not immed. safety issue
197a	C	Risk significance of BA on RPV head is low NRC
222	C	NRC staff believed dry boric acid not corrosive
226	C	Postulated breech of RPV not considered
227	C	Industry and NRC were managing BA issue by leakage
228	C	NRC doesn't review all of the industry guidance on BA
229	C	NUMARC 1993 and NEI 1995 letters - GL88-05 will let the industry locate leaks before a real problem is identified
233	C	1993 2.206 Greenpeace response - cracking issues
	d	**NRC failed to establish adequate requirements.**
139	D	Enforcement history doesn't equate with OE
140	D	Lack of enforcement for RCS leakage
141	D	Enforcement/NRR trying to figure out what should be done for RCS leakage
142	D	1997 SONGS nozzle cracking cited Maintenance Rule
143	D	NRC response (policy) not consistent - SONGS/Oconee
145	D	No ASME Code requirement (of inspections/RCS leakage)
146	D	Code didn't require insulation to be removed for inspections
147	D	VC Summer had RCS leakage and didn't report it
149	D	Several "no color" issues design -vs- performance
205	D	12/31/2001 was an arbitrary date for shutdown; basis question
219	D	Code did not require insulation removal (VT-2)
243	D	Enhanced visual meant for circ, not axial cracking (vol NDE)
245	D	ANO a through wall CRDM crack is a statistical certainty
253	D	Several CRDM nozzles cracked, some through wall NRC
	e	**NRC inspection and assessment programs failed to adequately assess DB performance**
1	E	Region viewed Davis-Besse as good performer.
8	E	PM inspection approach changing.
21	E	One PPR summary listed CAC cleaning
25	E	PI&R/40500 did not review area
26	E	PI&R samples began 1999 for 3/01 (gap issue)
27	E	Gap of 2 ½ years between CA inspections (missed events)
39	E	Inspection reports don't list all docs reviewed (6 years of reports)
44	E	RC-2 escalated enforcement didn't require closeout inspection

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46	E	Inspection on RM didn't provide any performance issues
47	E	Neither the old/new insp programs found/discussed RM issues
51	E	Former SRI did not perform any followup on leak hunt plan RFO12
55	E	NRC prompted Lic regarding RCS leak on MUIA described as positive in IR
56	E	DB PIR viewed as the best by RIII
60	E	62001 cancelled in 10/01
67	E	NRC audit of BAC didn't include Rx head/instr
71	E	Not enough hours in ROP for (BA) inspections didn't allow some inspection
72	E	Verbatim comp. W/insp procedures (not there/can't do)
73	E	Can't go outside of the baseline unless you have a >green finding
74	E	Baseline inspection doesn't include structures or passive components
75	E	ROP eliminated good practice of containment closeout insp
82	E	ISI didn't look at A600
85	E	RIII issued SL3 for RC-2; would be a green finding today
86	E	RC-2 event would have not gone beyond baseline
96	E	RIII had differing views for RC-2 followup
100	E	Some interviews indicated RI/SRI not as visible in ctmt and CR post ROP
106	E	MC2515 AppD doesn't provide thorough guidance for review of CR
115	E	NRR PM limited visits to DB
121	E	NRC thought that the licensee was rigorous in their leak hunt
122	E	RI thought the RPV head was 100% cleaned
127	E	ALARA insp didn't show that CAC cleaning was largest dose
204	E	No process for verifying licensee info for continued operation
206	E	PM don't conduct site visits
207	E	Some PM haven't visited plants
208	E	PM didn't review commitment change reports
211	E	NRR not implementing procedures
212	E	LA/SE for RM for RCS leakage didn't consider DB OE
213	E	NRR perception was that DB was a good performer
224	E	Risk informed process didn't alert the NRC to a potential risk
225	E	Over-reliance on risk information -vs- deterministic
252	E	62001 intended for 16 hours every other outage
270	E	Kerosene burner not eval'd for ctmt
271	E	No oper eval for the clogging of CACs
272	E	Non-conservative assumption of LOCA steam clean CACs
278	E	Lic didn't complete all RC2 CAs
290	E	No doc'd eval of CAC clogging

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293	E	All PI's green prior to event
294	E	Inadequate temp mod safety eval on code safety seat leakage
	f	**NRC staff resources & experience**
2	F	NRC staffing level not filled for all positions
3	F	One year period (1999), only one Resident on site.
4	F	Project Engineer - two 8-month gaps.
5	F	Resident inspectors not certified.
6	F	SRI position delayed in filling.
7	F	High Project Manager turnover rate (9 PMs in 10-years)
9	F	Limited commercial nuclear experience RI
10	F	Resident inspector had a materials background
11	F	SRI experience with only DB containment
40	F	Low number of inspection hours compared to other RIII sites (½ in 1999)
53	F	1998 events diverted inspection efforts re:BA issues
57	F	Resident not aware of OOS logs
63	F	PE little time at DB (1997&1999)
92	F	Between PE coverage gaps, 8 months/3months coverage/8 months
93	F	BC had Clinton 0350 plant coincident w/DB
110	F	RIII resources decreasing
111	F	RIII insp contractor support poor
112	F	RIII too many competing priorities which detract from insp.
131	F	No 1245 cert requirements for BA corrossion
158	F	Contract support after '98 report dried up (staff decreased/# reports decreased)
167	F	AEOD had 80+ FTE; now 2.5 FTE for OE (RES)
215	F	No guidance for background training for PM
	g	**NRC failed to communicate critical information**
17	G	Other than DD-DRP; others didn't recollect CAC/RM issues
94	G	NRR inspection branch has no feedback form on Plant status time as addressed by RI interview
101	G	Procedure for RIII morning meeting isn't followed
102	G	RIII not conducive to info exchange
103	G	Senior RIII Managers not the audience for the morning meeting
117	G	RI not aware of FeO on CAC
126	G	RA didn't know about BA on head
136	G	IRO didn't participate to follow MD8.3 for AIT determination
137	G	NRR/RIII didn't follow MD8.3
203	G	Deferral of DB shutdown not well documented

ok

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~~NRC~~ PreDecisional

216	G	Interviews indicate that NRR and RIII communications poor/nonexistent
291	G	Late arrival of calcs for crack propagation
	h	**NRC failed to adequately assess relevant operating experience**
157	H	OE review in NRC not performed by independent or long review
163	H	NRR is reactive for short-term/current event
166	H	NRC generic issue program takes too long/too hard...use bulletins instead
170	H	Foreign OE was reviewed by NRC
171	H	70 LERs about Boric Acid leaks
172	H	Axial cracks known from early 1970s , Circumferential from 1980s
173	H	LIC-503 references some wrong procedures in RES
183	H	No clear process for using foreign experience
184	H	French corrective actions were documented but never used
185	H	Mind set that French CA was an over reaction from NRC perspective; aggressive inspection was reponse
186	H	NRC never asked the French why they were replacing their RPV heads
188	H	Swedish, Spanish, Japanese, French have replaced heads
193	H	NRR staff not aware BA leakage OE
209	H	RES procedure 2i not used/not known by staff
210	H	Cracking/BA corrosion not considered by either NRR or RES to be a GI (MD 6.4)
230	H	GI program relies on user needs before taking action
231	H	Preferred process flow for OE: nothing; IN; BU; GL; GI (all else fails)
297	H	No NRC review of submittals/reports (ISI)
	i	**Licensee failed to implement owners group guidance.**
202a	I	DB was the only B&W licensee that didn't do inspections (ref GL97-01) LIC
236	I	No BWOG verification for implementation of GL97-01
237	I	No BWOG verification for implementation of GL88-05
247	I	No tracking system to ensure that industry guidance was included in site guidance/ processes.
261	I	93 B&W report flange leaks need to be eval first
289	I	BA corr handbook shows CAC/RM as evidence of RCS leak
	j	**Licensee failed to understand implications of BA corrosion.**
32	J	BA on head was a "routine" CR
36	J	1996 CR on BA stayed open for ~2 years
130	J	BA buildup not a safety issue by DB
155a	J	NUREG 6245 (CRDM crack) Industry not aware of B&W content
178	J	BACC person also had many other duties as a system engineer
194	J	BWOG rep didn't know the significance of Brown/red tinted BA buildup

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NRC PreDecisional

197	J	Risk significance of BA on RPV head is low LIC
217	J	BA procedure not "QA" until 5/02
234	J	Mod on service structure delays
239	J	Ombudsman & cleaning statements
274	J	PRG staff didn't viewed head tapes
275	J	Former VP viewed as-found, not after tape until Fall2001
282	J	Only staff involved in head cleaning
296	J	PCAQ 96-0551 was one of ten oldest CRs before it was resolved
298	J	Multiple people involved in head cleaning w/o raising issues
299	J	Same job done by Framatome at other plants?
	k	**Licensee failed to resolve chronic RCS leakage.**
24	K	Routine CAC cleaning
108	K	CAC/RM fouling may have been the impetus for TS change in #107
109	K	HEPA filter for RM may defeat the purpose of the RM workarounds -vs- fix the problem
119	K	Licensee not rigorous in finding RCS leaks
120	K	Licensee deleted Mode 3 walkdown for BA
235	K	CAC fouling and ALARA
244	K	DB entered a 6-hour shutdown TS situation because of RM Problems with BA
248	K	Ability to differentiate between flange leakage/ head penetration leakage
255	K	Until RFO13 lic had flange leaks
262	K	Heavy boron buildup on CACs
268	K	No systematic leak search for 12RFO
269	K	Deleted mode 3 walkdown
273	K	Long history of thermowell leaks
280	K	Triage plan for flange leak / didn't fix all flange leaks
287	K	100% NDE 5.7Rem estimate <past head cleaning
300	K	Relief valve mod masking other leaks in 1998-99 time frame
	l	**Licensee failed to properly implement an adequate BACC program.**
34	L	1996 CR explicit on the BA concern
35	L	~50% of RPV head cleaned in 1996
70	L	BAC checklists not kept/tracked/trended
123	L	None of the RPV head cleanings were 100%
124	L	Lost control of video tapes
144	L	BAC procedure wasn't followed
251	L	Appropriate cleaning methods for RPV head (water-vs-vacuum)
254	L	#4, 5 nozzles still had boron on them following cleaning

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260	L	Couldn't complete head cleaning due to schedule pressure
263	L	Potential CRDM G9 leak was crack, not dispositioned
266	L	RCS sys engr: scaffold was removed without permission
267	L	RP considered head cleaning as decon, so no procedure
279	L	No deviations from RFO12 WO to clean RPV head
281	L	RCS sys engineer upset that they head wouldn't be totally cleaned
283	L	Index of head tapes incomplete
284	L	4/17/00 head mislabeled as as-left
285	L	Head inspection tape not documented as to what was actually inspected - QA zip
	m	**Licensee failed to learned from internal/external OE.**
68	M	DB's BACC didn't include Rx head/instr until 5/02
151	M	Oconee OE not evaluated at DB until 5/2002
152	M	OE in US...Boric acid leaks. #1 area was CRDM, DB considered not significant
153	M	100% B&W units had RCS PB leakage
162	M	DB OE procedure doesn't require NRC LER review
168	M	100% CE had RCS pressure boundary leakage
174	M	45% of Oconee cracking (CRDM) appears in the same quadrant as DB leakage problems
175	M	CE plants dominated RCS instrumentation nozzle leakage (10 of 13 leaks)
176	M	Average # of operating years prior to CRDM leakage ~22 years
179	M	Foreign experience would indicate that the "crack" model is flawed
191	M	NUREG/CR 6245 recommended enhanced online leakage detection systems (NRC?)
192	M	Calvert Cliffs LER indicated wet boron vs dry
198	M	Annealing nozzle temps were different than required
200	M	3 LERS involved pzr material wastage
218	M	B&W recommended the service structure mod
276	M	Two precursor BA events...RC2, SG line
	n	**Licensee staff resources & experience**
159	N	40-50% DB staff decrease over 10 years
246	N	Multiple job assignments depending on cycle (outage, ops, EP)
277	N	Lack of system engineer continuity
	o	**Licensee failed to communicate critical information**
150	O	Lic Response to BU2001-01 contained many inaccurate info /response
177	O	Many licensee (DB) staff thought that a whole head inspection/cleaning was done
264	O	Lic Managers / staff knew of head cleaning %, lower staff thought that head was 100% cleaned
265	O	Lic managers said they showed NRC the as-found video tapes of the head

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	w	Awaiting additional review
31	W	We rely on lic to give NRC correct info
37	W	Long time to close out CRs
54	W	CCW event (10/98) resulted in Spec Insp
64	W	Limited entries into containment by NRC
78	W	1997 NOP/NOT walkdown by NRC found no leaks
81	W	1992 uptake event insp closeout, then 1998 uptake occurred
84	W	RIII factored BU2001-01 commitments as part of Baseline prog.
89	W	RIII invoked MC0350 w/o DB having met criteria
90	W	DB event risk not completed yet
91	W	SDP has taken 5 months
113	W	Only 1 SES manager inside containment since 1996
114	W	Limited senior manager visits to DB
134	W	No NRC review of Ombudsman files
138	W	Range of opinions on whether an AIT/IIT/SI
180	W	Story differences between what DB told NRC -vs- what NRC thought they were told about BA by DB
181	W	NRR not told about red/brown BA buildup until after the DB event
182	W	After the RPV head videos were shown to the NRC, a vote was taken: 3 for shutdown; remaining (10-13) voted to allow continued operation
196	W	Conclusion in the EPRI guidebook not supported
199	W	"Boric acid on the head is good."
214	W	INPO ratings declined from 1 to 2 within the last few years
220	W	DB experienced no insulation deflections caused by BA buildup on the head
221	W	License Renewal report (GALL) addresses acceptability of GL88-05 for aging management to be updated to reflect lessons learned
223	W	Extending the inspection for DB was largely based on the belief that a "strong" VT-2 inspection was done at DB
238	W	O&M/capital budget and actuals have decreased over last 10-years
240	W	BU2001-01 documentation responses by DB not accurate
241	W	12-16 people at DB reviewed DB response to BU2001-01
242a	W	MNSA - repair of joints, boric acid issues NRC
242	W	MNSA - repair of joints, boric acid issues LIC
249	W	Bonus correlation with operations
256	W	VP - No NDE tools by 12/31
257	W	VP -Ops last know
259	W	Lic did not eval use of power washer

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NRC PreDecisional

292	W	QA group didn't have a problem with BAC RFO12 report shows positive finding
295	W	NRC questioned how the licensee was able to do a visual insp. given that boron was left on the head
	x	**Deleted**
30	X	CRs reviewed for PI&R ~7000
48	X	SSDI insp in 2000 indicated performance was worse than expected
69	X	40500 insp in '98 indicated that commitment tracking NG
79	X	SRI 97-98 no recollection of flange leaks
80	X	Former SRI works for FENOC
99	X	PI&R doesn't allow independent look by inspectors
104	X	PI&R team leader thought that the short form description of CR was adequate
135	X	RIII inspector was told that DB was SALP 1 didn't take findings seriously (arrogant)
148	X	Nothing in allegation area was relevant to BA/cracking issues
195	X	BACC person indicated that the next major nuclear accident will be caused by BAC
250	X	Basis for dose estimates for RPV head inspections
258	X	Eng received closed door talking to for CR initiation
286	X	Lic is doing an assessment of BU2001-01 submittal
288	X	No VT-2 insp during RFO12 per RCS sys eng