

WESTINGHOUSE CLASS 3

WCAP-11964

NRC UPDATE MEETING
SOUTH TEXAS BMI
FLUX THIMBLE WEAR
AUGUST 10 1988

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RCS COMPONENTS LICENSING

WORK PERFORMED UNDER SHOP ORDER TGXM-12218

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NRC UPDATE MEETING

SOUTH TEXAS BMI FLUX THIMBLE WEAR

AUGUST 10, 1988

AGENDA

- O SUMMARY OF THE MAY 17 HL&P/W/NRC MEETING
- O CURRENT WESTINGHOUSE 14' CORE PLANT STATUS
- O OVERVIEW AND PRELIMINARY CONCLUSIONS OF MOL
HOT CELL EXAMINATIONS
- O SUMMARY OF THE WALTZ MILL TESTS WITH FLOW
LIMITERS
- O UPDATE ON FRENCH 14' CORE OPERATING PLANTS
- O SOUTH TEXAS UNIT 1 AND 2 PLANNED ACTIONS

SUMMARY OF THE MAY 17TH MEETING

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- o EDDY CURRENT INSPECTION IS CONSERVATIVE IN MEASURING WEAR
- o USE OF A LINEAR WEAR RATE IS A VALID TECHNIQUE FOR PREDICTING THIMBLE WEAR
- o SOUTH TEXAS UNIT 1 WILL CONTINUE TO OPERATE SAFELY BY FOLLOWING THE PREVIOUSLY IMPLEMENTED PLANT
 - THE NEXT ECT OF THE FLUX THIMBLES SHALL BE CONDUCTED AFTER AN ADDITIONAL 16 WEEKS OF 4 PUMP FLOW, OR SOONER IF A LONG ENOUGH OUTAGE OCCURS
- o RESULTS OF THE MOL HOT CELL EXAM SHALL BE PRESENTED TO THE NRC

SUMMARY OF OPERATIONAL EXPERIENCE WITH FLOW
LIMITERS
SOUTH TEXAS UNIT 1

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* INDICATES THIMBLES THAT HAVE WEAR AT THE FLOW
LIMITER AND OTHER ELEVATIONS

CURRENT PLANT STATUS - 14' CORE PLANTS

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o SOUTH TEXAS 2 - CURRENTLY UNDER CONSTRUCTION

TIHANGE 3 OPERATING PLAN

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o BY FOLLOWING THE ESTABLISHED PLAN THE TIHANGE 3
UNIT OPERATED SAFELY UNTIL THE NEXT SCHEDULED
REFUELING

CURRENT PLANT STATUS - SOUTH TEXAS UNIT 1

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THIMBLE INSPECTION INTERVAL

CONSERVATISMS IN REPORTED THIMBLE WALL LOSS

[a,c,e]

o WITH LARGE WEAR SCARS ECT IS CONSERVATIVE

[a,c,e]

o CONSERVATIVE WEAR SCAR ASSUMPTION FOR
CALIBRATION OF ECT

- CONSERVATISM CONFIRMED BY HOT CELL EXAM
OF TIHANGE THIMBLE SAMPLES

o WEAR RATE CAN BE SHOWN TO DECREASE WITH TIME

- LARGER WEAR SURFACE

a, c, e

STP/TIHWAGE EDOY CURRENT DATA

Number of Tumble Tubes

STP % Water TIHWAGE

HOT CELL EXAMINATION OF TIRANGE 3 SAMPLES

(MOL, BELGIAN CENTER FOR NUCLEAR STUDIES)

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HOT CELL EXAMINATION OF TIHANGE 3 SAMPLES
(MOL, BELGIAN CENTER FOR NUCLEAR STUDIES)

SCHEDULE

- O HOT CELL WORK COMMENCED 6/30/88
- O PRELIMINARY VISUAL EXAMS COMPLETED 7/1/88
- O FLOW LIMITER SPRING RATE TESTS COMPLETED
7/1/88
- O FLOW LIMITER OVERALL HEIGHT MEASUREMENTS
COMPLETED 7/6/88
- O FINAL REPORT DUE FROM MOL BY SEPTEMBER 30,
1988

HOT CELL EXAMINATION OF TIHANGE 3 SAMPLES

(MOL, BELGIAN CENTER FOR NUCLEAR STUDIES)

PRELIMINARY OBSERVATIONS (CONTINUED):

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HOT CELL EXAMINATION OF TIHANGE 3 SAMPLES
(MOL, BELGIAN CENTER FOR NUCLEAR STUDIES)

PRELIMINARY OBSERVATIONS:

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HOT CELL EXAMINATION OF TIHANGE 3 SAMPLES
(MOL, BELGIAN CENTER FOR NUCLEAR STUDIES)

PRELIMINARY OBSERVATIONS: (CONTINUED)

[] a,c,e

o OVERALL HEIGHT OF 4 FLOW LIMITERS MEASURED

[] a,c,e

HOT CELL EXAMINATION OF TIHANGE 3 SAMPLES
(MOL, BELGIAN CENTER FOR NUCLEAR STUDIES)

PRELIMINARY CONCLUSIONS: (FLOW LIMITER)

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- o FLOW LIMITER PERMANENT SET OR SHORTENING IS ATTRIBUTED TO:

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[]

MOL FLOW LIMITER MEASUREMENTS

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CORE LOCATION

F. L. OVERALL
HEIGHT

BOT. NOZZLE HGT

BOT. NOZZLE HGT
(AFTER 1 CYCLE)
HEIGHT CHANGE
DUE TO WEAR

F. L. OVERALL
HEIGHT
(AFTER 1 CYCLE)
OVERALL HGT CNG

HEIGHT CHANGE NOT
DUE TO WEAR

NOTES

WALTZ MILL FULL FLOW TEST SUMMARY

JUNE 1988

CONFIGURATIONS TESTED

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WALTZ-MILL FULL FLOW TEST SUMMARY

JUNE 1988

TRIMBLE VIBRATION WITH A FLOW LIMITER

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Trimble RMS Vector Vibration Velocity At The Elevation
Of The Fuel Assembly Nozzle (in/sec)

$DP\ TOTAL = DP\ LSP + DP\ ORIFICE$
□ 2 will preload + 2 will preload + 30 will go ▲ 10 will shko, X max. w/sal. ▼ max. w/sal.
Sept. Cond. A Sept. Cond. B Sept. Cond. B Sept. Cond. B Sept. Cond. A Sept. Cond. A

WALTZ MILL FULL FLOW TEST SUMMARY

JUNE 1988

THRIBBLE VIBRATION WITHOUT A FLOW LIMITER

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Thrubble MSB Reactor Vibration Velocity At The Elevation
Of The Fuel Assembly Nozzle (in/sec)

□ MS A

+ MS B

DP TOTAL = DP LSP + DP ORIFICE
⊕ MS A △ MS B

x MS A

v MS B

1.025 ft. w/ flow limiter

WALTZ MILL FULL FLOW TEST SUMMARY

RESULTS AND CONCLUSIONS

CORRECTIVE MEASURES ASSESSMENT

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WALTZ MILL FULL FLOW TEST SUMMARY
RESULTS AND CONCLUSIONS

WEAR CAUSE - TIRHANGE 3 AND DGEL 4

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SUMMARY OF RECENT FRENCH 14' CORE PLANT OPERATING EXPERIENCE

SEVERAL FRENCH PLANTS HAVE NOW OPERATED WITH CORRECTIVE HARDWARE FOR ONE OR MORE CYCLES. RESULTS FROM THESE PLANTS ARE SUMMARIZED BELOW.

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THIMBLE SIZE	}
SLEEVE SIZE	
<u>SPRING CAP</u>	
WEAR DEPTH*	
< .004	
.004-.006"	
.008-.012"	
.012-.016"	
.016-.020"	
> .020"	

*WEAR DEPTH AFTER ONE CYCLE OF OPERATION

CONCLUSIONS FROM THE JUNE 24 FOUR PARTY MEETING
(WESTINGHOUSE/FRAMATOME/EDF/CEA)

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SOUTH TEXAS UNIT 1 SHORT TERM ACTIONS

o DURING THE UPCOMING OUTAGE IN SEPTEMBER;

[

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o BASED ON INSPECTION RESULTS: NEXT INSPECTION INTERVAL WILL BE DETERMINED.

SOUTH TEXAS UNIT 1 LONG TERM ACTIONS

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- o DURING FIRST REFUELING
OUTAGE;

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SOUTH TEXAS UNIT 2 PLANNED ACTIONS

PRIOR TO CORE LOADING;

- INSTALL MANUAL THIMBLE ISOLATION VALVES

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BASIS FOR THE SOUTH TEXAS ACTION PLAN

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BASIS FOR THE SOUTH TEXAS ACTION PLAN

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