OFFICE OF THE SECRETARY
CORRESPONDENCE CONTROL TICKET

Date Printed: Feb 28, 2013 15:23

PAPER NUMBER: LTR-13-0182 **LOGGING DATE:** 02/28/2013

ACTION OFFICE: EDO

To: Leeds, NRR
cys: OEDO
RIV
Merzke, OEDO

AUTHOR: Ace Hoffman

AFFILIATION: CA

ADDRESSEE: Chairman Resource

SUBJECT: Provides San Onofre Data and Curves for today's NRC Hearing - 2/27/13

ACTION: Appropriate

DISTRIBUTION: SECY to Ack.

LETTER DATE: 02/27/2013

ACKNOWLEDGED Yes

SPECIAL HANDLING:

NOTES: 2 e-mails

FILE LOCATION: ADAMS

DATE DUE: **DATE SIGNED:**

Template: SECY-017 E-RIDS: SECY-01

Joosten, Sandy

From: Ace Hoffman [rhoffman@animatedsoftware.com]
Sent: Wednesday, February 27, 2013 12:11 PM
Subject: San Onofre Data and Curves for today's NRC hearing! (2/27/2013)
Attachments: San Onofre Confidential Data and Curves1.docx; ATT00002.txt

2/27/2013 9:am PST

Dear Readers,

While listening to the upcoming NRC hearing on San Onofre about to be webcast from Maryland in about an hour (see below for more information), the attached "doc" file may be useful to review; it's the latest from the DAB Safety Team.

Sincerely,

Ace Hoffman
Carlsbad, CA

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From: Martha Sullivan <marthasullivan@mac.com>
Subject: Reminder: TODAY 10a-1p PST, NRC Mtg w/ SoCal Edison on Restart of San Onofre/Web- and Audio-cast Available

Reminder: TODAY 10a-1p PST, NRC Mtg w/ SoCal Edison on Restart of San Onofre. Telephone Bridge and Webcast from Mtg in Rockville MD Available. The purpose of the meeting is to discuss the U.S. Nuclear Regulatory Commission (NRC) staff's review of Southern California Edison's (SCE's) October 3,2012, response to the NRC's March 27, 2012, Confirmatory Action Letter for San Onofre Nuclear Generating Station, Unit 2. The NRC staff issued Requests for Additional Information (RAls) to SCE on December 26, 2012, and February 1, 2013 (the latter RAI included proprietary information). This meeting will include discussions on the licensee's responses to the RAls, the status of any outstanding questions from those RAls, and any additional questions issued by the NRC staff prior to the meeting.

This is a Category 1 Meeting. The public is invited to participate in this meeting and will have one or more opportunities to communicate with the NRC after the business portion, but before the meeting is adjourned. Proprietary information may be discussed during the meeting. These discussions will be deferred to the end of the meeting, which will be closed to members of the public who have not been granted access to the

Interested members of the public can participate in this meeting via Webcast link or toll-free audio teleconference. The Webcast link can be accessed at: http://video.nrc.gov.This/ link to the NRC webcast page will permit the user to select the meeting to be viewed and the viewing speed. The meeting link will become active approximately one hour prior to meeting start. The teleconference bridge number is 888-677-3916; passcode 8530507. Callers will initially be placed in a "listen only" status. At the designated point in the agenda, two-way calling will be enabled, so that the public may ask questions of the NRC staff regarding the meeting discussions.

DAB SAFETY TEAM

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Table 1 – San Onofre RSGS Design and Operational Data

Design and Operational Parameters which caused FEI, FIRV and MFE	U2 RSGs @100% Power	U2 RSGs @70% Power	**U2 RSGs @MSLB**
(1) Reactor Thermal Power, MWt	**1729**	**1729**	**1729**
(1A) Unit Electrical Generation, MWe	1183	?	N/A
(2) Number of Tubes	9727	9727	12,580
(3) Average Length of Heated Tubes, inches m	729.56	729.56	729.56
(4) Heat Transfer Area, ft2	116,100	116,100	116,100
(5) Tube Wall Thickness, inches	0.043	0.043	0.043
(5A) Tube Diameter, inches	0.75	0.75	0.75
(5B) Tube Pitch, inches	1.0	1.0	0.87
(5C) Tube Array	Triangular	Triangular	Triangular/Square
(5D) Tube Index	1.33-1.43	1.33 – 1.43	1.52-1.67
(5E) Tube to tube clearance, inches	0.25	0.25	
(5F) Nominal Gap between tube and AVB", cold, inches	0.002	0.002	0.003
(5G) Nominal Gap between tube and AVB", Hot, inches	0	0	0
(5H) Nominal Gap, Manufacturing Dispersion, inches	N/A	N/A	N/A
(5I) Tube Wall Thickness/Tube Diameter Ratio	0.057	0.057	0.057
(5J) Average Heated Tube Length/Tube Diameter Ratio	973	973	973
(6) Reactor Coolant Flow (at cold leg temperature), , Million lbs./hour	79.8	**78.2**	**78.2**
(6A) Reactor Coolant Operating Temperature (Thot), ^{0}F	598	591	591
(6B) Reactor Coolant Operating Temperature (Tcold), ^{0}F	541	551	551
(7) RSG Operating Pressure (@100% power), psia	892	946	ATM
(8) Steam Operating Temperature (@ 0% power), ^{0}F	531	538	212
(8A) Steam Flow, Million lbs./hour	7.6	5.1	549
(8B) Feed-water Inlet Temperature , ^{0}F	442	407	N/A
(9) Feedwater Flow, Million lbs./hour	7.6	5.1	33.8* to Environment in 3-5 Minutes
(10) Steam Quality, %	90%	36%	> 90%
(11) Void Fraction, %	98.5%	92.6%	100%
(11A) Maximum Gap Fluid Velocity, feet/second	25.1	12.6	> 50
(11B)Secondary fluid density, lbm/cubic feet	7	12	< 7
(12) Reactor Coolant Volume, ft3	2003	2003	2003 to Environment in 3-5 Minutes
(13) Circulation Ratio	3.3	4.9	0
(13A) Down-comer Feed-water Flow, Mlbs./hour	24.8	24.8	0
(14) Delta $T_e = (T_S, 6A) - (T_{SAT}, 7A)$, ^{0}F	67	53	**~400**
Fluid Elastic Instability	NO	NO	**YES (Film Boiling) Significant Radiation**
Flow-induced Random Vibration	YES	YES	**YES**
Mitsubishi Flowering Effect	YES	NO	**YES**
Flashing Feedwater Jet Impingement Forces on Tubes	NO	NO	**YES**

Compilation of data based on Publicly Available Documents (e.g., Westinghouse Operational Assessment, SCE Unit 3 Root cause Evaluation, http://www.efunda.com/materials/water/steamtable_sat.cfm, **etc.)**

The DAB Safety Team is dedicated to furthering public understanding of the San Onofre Nuclear Generating Station nuclear safety issues and dangers of Restarting Unit 2

Media Contact: Don Leichtling (619) 296-9928 or Ace Hoffman (760) 720-7261

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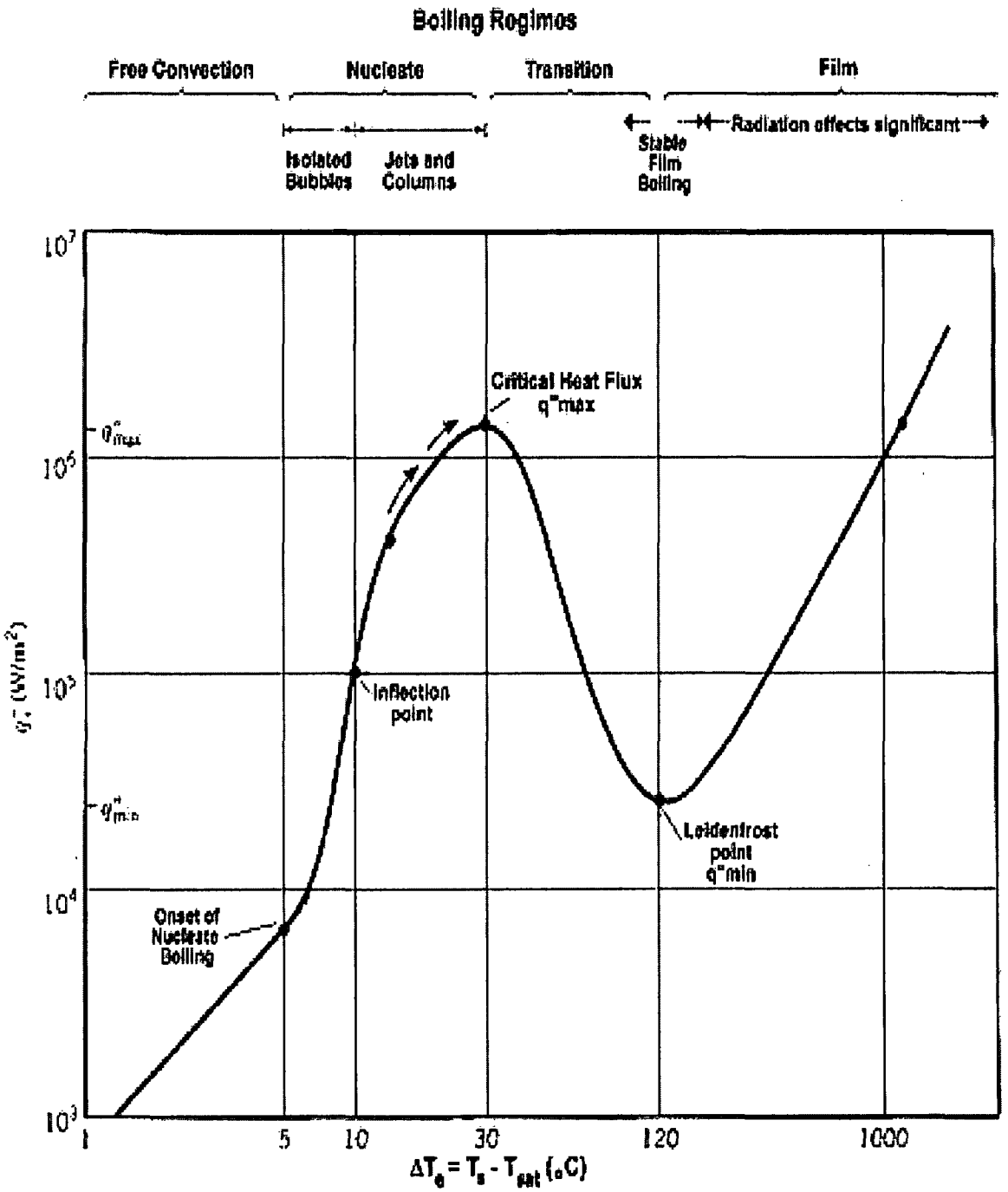

Boiling Curve for water at 1 atm.
Surface heat flux q" as a function of excess temperature $\Delta T_e = T_s - T_{sat}$

http://en.wikipedia.org/wiki/Film_boiling

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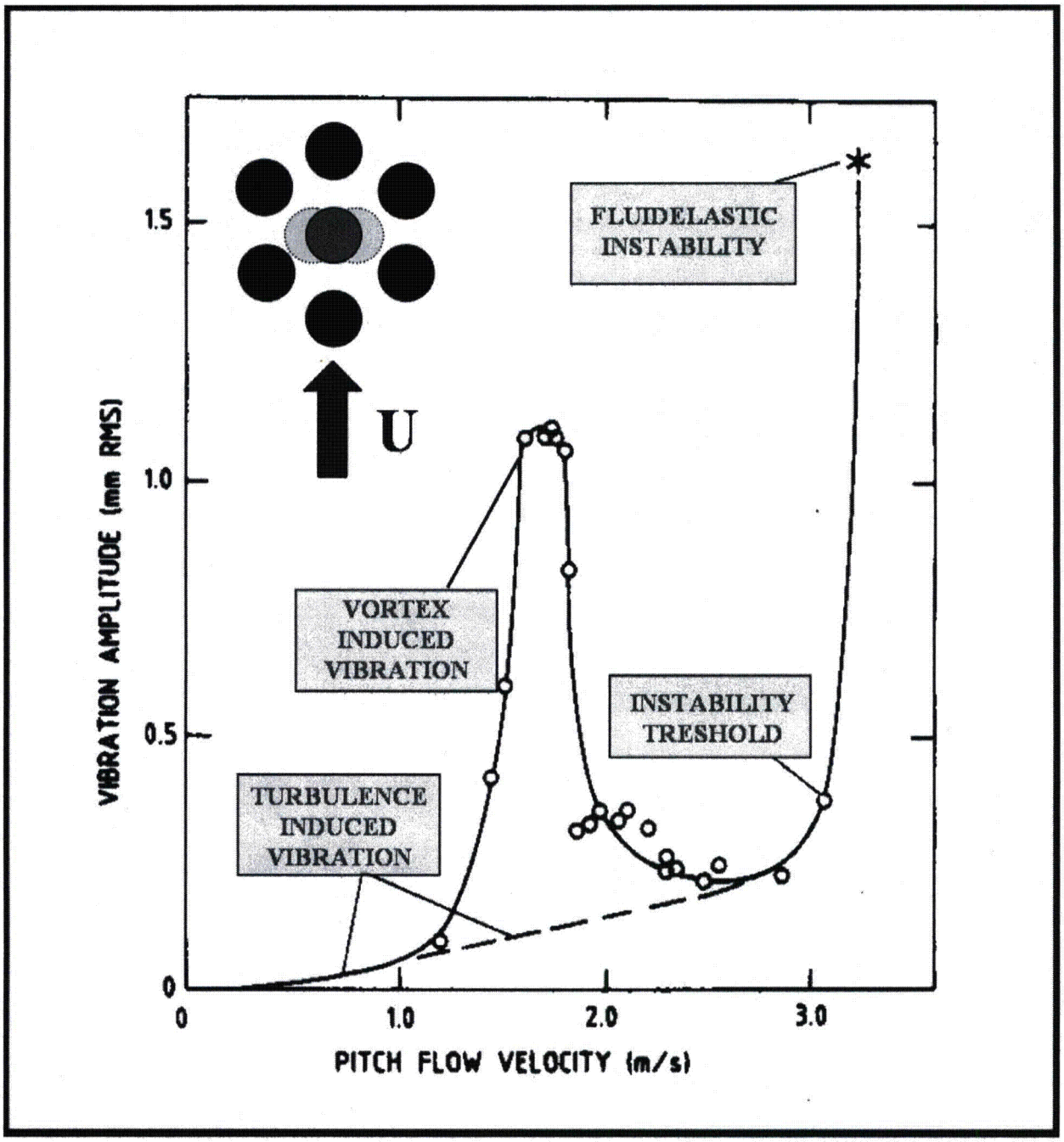

Figure 1 – Vibrations amplitude as a function of flow pitch velocity for a flexible cylinder in a rigid cluster (taken from Pettigrew et al. 1991). The cylinder is free to vibration in the cross-flow direction.

Reference: Violette, R., Pettigrew, M.J., Mureithi, N.W. (2006). Fluidelastic Instability of an Array of Tubes Preferentially Flexible in the Flow Direction Subjected to Two-Phase Cross Flow. *Transactions of the ASME. Journal of Pressure Vessel Technology, 128(1),* p. 148-159.

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Joosten, Sandy

From: Ace Hoffman [rhoffman@animatedsoftware.com]
Sent: Wednesday, February 27, 2013 12:25 PM
Subject: Two small corrections to the previous email...

2/27/2013

Dear Readers,

The title of the third column of "Table 1 - San Onofre RSGS Design and Operational Data" in the previous email should read: "Unit 2 @ MSLB @ 70% power."

Also, the correct URL to go to the NRC webcast portal is:
http://video.nrc.gov

These have been corrected in the online version.

Best wishes,

Ace

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