OFFICE OF THE SECRETARY
CORRESPONDENCE CONTROL TICKET

Date Printed: Jun 10, 2010 16:25

PAPER NUMBER: LTR-10-0264

LOGGING DATE: 06/10/2010

ACTION OFFICE: OPA

OPA Action Item #:	10-034
Assigned To:	EB
Due Date:	6/25
SECY Ticket #:	LTR-10-0264
ADAMS Package #:	ML10670617
ADAMS Incoming#:	ML10670619
ADAMS Response #:	ML

AUTHOR: Edward Peschko

AFFILIATION:

ADDRESSEE: Eliot Brenner

SUBJECT: Followup interview to Dr. Jaczko's Stan

ACTION: Appropriate

DISTRIBUTION:

LETTER DATE: 06/09/2010

ACKNOWLEDGED No

SPECIAL HANDLING:

NOTES:

FILE LOCATION: ADAMS

DATE DUE:

DATE SIGNED:

Sandy Joosten

From: Edward Peschko [edp@yahoo-inc.com]
Sent: Wednesday, June 09, 2010 9:26 PM
To: Brenner, Eliot
Cc: CHAIRMAN Resource; Edward Peschko
Subject: Re: Followup interview to Dr. Jaczko's Stanford talk

Eliot,

Thanks for doing this.. As for me, I've put together a list of – IMO - very pertinent questions for the NRC for which it would be great to get answers.

And whether or not an interview happens, I'm hoping that you guys address them (or have addressed them already).

Call me a bit radical (or insane), but I'm a 'nuclear' voter: my number one criteria for whether or not I vote for someone is their stance on nuclear power and what they want to do to help its sustainable growth.

I also have the somewhat non-mainstream view that the US – when it turned against next generation nuclear technologies (especially liquid salt reactors), it basically rejected the next internal combustion engine, and we are all suffering as a result today.

Hence, how you guys proceed, and structure yourselves to expedite these technologies by lowering nuclear barriers in the US (whilst maintaining your safety profile) IMO is of paramount importance. Our fate is truly in the balance with this issue - whether or not we as Americans keep our lifestyles and status, or slip into mediocrity and irrelevance in the 21st century.

And I am a strong believer that the NRC can rise to the challenge – that it just takes a hefty dollop of new thinking.

Anyways, again, thanks for the talk, and I'll look for the slides..

Ed

(ps – I should clarify, I'm in no way connected with Mr. Adams, except for reading his blog... Although again, I think he makes a very solid case with his posts..)

Topics to cover, warning in advance (its a bit long):

- **Measure of independence of the NRC**. One of the gratifying things I heard during the presentation was that the NRC has some independence - outside of congress - with regards to regulation matters, and hence would have (for example) the ability to change the fee structure and procedures on how it certifies reactors.

Questions: Is this an accurate assessment of the situation? If so, where does the NRC draw the line on what it can independently do and what it is reliant on congress to legislate?

- Discrepancy between US and chinese/south korean nuclear costs.

I had a chance to briefly talk with Dr Jaczko about this after the talk. It was my understanding that nuclear plants were costing $1500-$2500/KW overnight cost in china/south korea, as opposed to our $6000-10000/KW here. Dr. Jaczko disputed this.

Anyways it seemed to me an odd thing to dispute given:

a) the historical costs of reactor construction in this country (http://www.phyast.pitt.edu/~blc/book/chapter9.html)
b) the original costing of the AP-1000 project in china ($6.3 billion for 4 1GW reactors),
c) the original cost estimates of westinghouse for the AP-1000 (at $1000/KW),
d) the literature costs of various power plants from world-nuclear (http://www.world-nuclear.org/info/inf02.html), and

e) the historical benefits that economies of scale bring to markets, which china certainly embodies.

Nonetheless I still haven't seen a good breakdown of costs between a representative, current US example and say a representative, current South Korean example of a reactor install.

Questions - What work has the NRC done on the breakdown of costs, US vs South Korea/China, and what were the findings?

- Alternate fuel cycles. Everything in the talk focused on the current, pressurized LWR designs, but all the research I've done points to other fuel cycles being quite a bit more efficient and cheap than their LWR counterparts (especially the MSRs and derivatives, especially ones based on thorium and U-233 - eg, http://nextbigfuture.com/2010/04/molten-salt-based-accelerator-driven.html)

Question: what work has the NRC done on preparing for these fuel cycles coming online?

- Military reactors. It seems to me that - for commercialization of alternative fuel cycles - it is *crucial* for the NRC to work with military agencies closely, and take any prototypes and/or other operational data that they make in consideration when civilian knock-offs occur, and to use this data as a 'shortcut' for making civilian use for m.

Question: Given DARPA's lead in pursuing these types of reactors (eg: https://www.fbo.gov/spg/ODA/DARPA/CMO/DARPA-SN-10-37/listing.html) what organizations does the NRC have in place to take whatever technologies the military develops and re-use the military experience to shorten the path to subsequent commercialization? (think ARPANET giving rise to the internet)

- role of standardization and automation. As an automation engineer, I can't help but think that the time in both certifying designs and in streamlining construction could be vastly reduced by the proper application of automation techniques.

Question #1. So, how 'cookie cutter' are the COL applications? Are they 'one off' - ie: each application tailor-fitted to the situation - or are they standardized across the given designs?

If they are standardized from design to design, there are several statistical techniques (eg: Latent Semantic Analysis or LSA) that could be used to gauge completeness of any given application - google and yahoo (my employer) regularly use this on a day-to-day basis to both judge the quality of data that they curate.

The idea here would be then, to use these same techniques to give applicants an idea of how complete their applications were and what sections need work - automatically - and only involve regulators AFTER the program has judged the submission sufficient for review (or the applicant asks for direct review – never trust a computer completely :)).

Likewise, if engineering firms could work towards a standardized API which simulates their designs (and the response of the designs to various accidents) and if results of these simulations could go towards design certification, then a lot of middlework could be avoided, as there would be no communications mishaps - a large part of the certification process would be simply running and verifying that the simulations were accurate and worked correctly. Think of a giant virtual wind tunnel, and you get the idea.

Question #2: has the NRC contracted with a google, or yahoo, or even IBM/accenture, to see how automation could streamline the licensing process?

Question #3 – Has there been work towards a centralized simulation API for helping with certification? It looks like I'm not the only one with this idea - what work is the NRC doing with ORNL, to support the following in fast-tracking certification: http://djysrv.blogspot.com/2010/05/oak-ridge-supercomputers-to-model.html

- **Small Modular Reactors (or SMRs)**. I was hoping in the presentation to get an update on how the NRC was planning on handling SMRs, which to me stand as the greatest hope we have for nuclear (or any other energy source for that matter.)

Question Group #1: How far away are we from comprehensive reform on how SMRs are licensed? Will the design be certified independently of the working environment (assuming the working environment is relatively stable like being buried and surrounded by x meters of concrete). Will the 'per reactor' licensing fee go away?

Question Group #2: One of the great things about SMRs is that they can be easily made as prototypes, and as pointed out in the presentation, nuclear issues arise in actual use, quite frequently. Hence, will prototypes - with appropriate safety sensors feeding back data to the NRC - be allowed in certification? If not, why not?

Question Group #3: Many of the safety issues with mass production come from the industrial environment in which products are made. Could the 'unit of certification' become the factory, instead of the individual reactor?

- **Uses for reactors aside from electricity.** Again, there are several uses for nuclear power that the US hasn't touched for domestic use - such as use in tar sands, large scale desalinization, creation of fuel oil from biomass or coal, making cement and/or steel, direct replacement of coal, etc. Complicating this fact is that most of these uses - due to high temperature operating conditions - require new fuel cycles, and that there is a great deal of urgency for them due to possible environmental catastrophe (I hate to think what would happen if the ogallala aquifer failed)

Question: How does the NRC intend on both certifying plants for nuclear power uses outside the electricity sector and regulating their ultimate use?

Received: from mail2.nrc.gov (148.184.176.43) by TWMS01.nrc.gov
(148.184.200.145) with Microsoft SMTP Server id 8.1.393.1; Wed, 9 Jun 2010
21:27:15 -0400
X-Ironport-ID: mail2
X-SBRS: 5.3
X-MID: 17943159
X-IronPort-Anti-Spam-Filtered: true
X-IronPort-Anti-Spam-Result:
AskCAAfcD0zYkTasmWdsb2JhbACBQ5EJjBEVAQEBAQEICwoHESKwUY45BIUYg00
X-IronPort-AV: E=Sophos;i="4.53,395,1272859200";
d="scan'208,217";a="17943159"
Received: from mrout2.yahoo.com ([216.145.54.172]) by mail2.nrc.gov with
ESMTP; 09 Jun 2010 21:27:14 -0400
Received: from sp1-ex07cas03.ds.corp.yahoo.com
(sp1-ex07cas03.ds.corp.yahoo.com [216.252.116.151]) by mrout2.yahoo.com
(8.13.8/8.13.8/y.out) with ESMTP id o5A1PxZ6066904; Wed, 9 Jun 2010 18:25:59
-0700 (PDT)
DomainKey-Signature: a=rsa-sha1; s=serpent; d=yahoo-inc.com; c=nofws; q=dns;
h=received:from:to:cc:date:subject:thread-topic:
thread-index:message-id:in-reply-to:accept-language:
content-language:x-ms-has-attach:x-ms-tnef-correlator:acceptlanguage:
content-type:mime-version;
b=GF+T6fSBhQ4ZDni5NNOohnwtfIU02J+Q4N53/zNco1y9feRUrR+qHIlFbFPpHn7A
Received: from SP1-EX07VS02.ds.corp.yahoo.com ([216.252.116.135]) by
sp1-ex07cas03.ds.corp.yahoo.com ([216.252.116.151]) with mapi; Wed, 9 Jun
2010 18:25:58 -0700
From: Edward Peschko <edp@yahoo-inc.com>
To: "Brenner, Eliot" <Eliot.Brenner@nrc.gov>
CC: "chairman@nrc.gov" <chairman@nrc.gov>, Edward Peschko <edp@yahoo-inc.com>
Date: Wed, 9 Jun 2010 18:25:57 -0700
Subject: Re: Followup interview to Dr. Jaczko's Stanford talk
Thread-Topic: Followup interview to Dr. Jaczko's Stanford talk
Thread-Index: AcsDYQa9XCGf9rdJp0WFlazdkl/sFAC9iauAAHlnSvM=
Message-ID: <C8358EBE.551B%edp@yahoo-inc.com>
In-Reply-To:
<9B0F2FAB6002B64EAABF7FE5FA27BC6C016D1C0F23@HQCLSTR01.nrc.gov>
Accept-Language: en, en-US
Content-Language: en
X-MS-Has-Attach:
X-MS-TNEF-Correlator:
acceptlanguage: en, en-US
Content-Type: multipart/alternative;
boundary="_000_C8358EBE551Bedpyahooinccom_"
MIME-Version: 1.0

Return-Path: edp@yahoo-inc.com