LSNReviews

From: Sent: To: Subject: Attachments: natalex [natalex@telus.net] Thursday, July 26, 2007 7:11 PM povetkooleg@hotmail.com; Oleg Povetko Loading Curve Evaluation for postclosure - Our Proposals Report.doc

Олег, глянь, ты это имел в виду?

Алексей.

PS

Сотик иду покупать сегодня, вроде решилась проблема - купил у них новую SIM карту за \$30 :)

From: natalex [mailto:natalex@telus.net]
Sent: Thursday, July 26, 2007 7:11 PM
To: povetkooleg@hotmail.com; Oleg Povetko
Subject: Loading Curve Evaluation for postclosure - Our Proposals

Oleg, take a look, did you mean this?

Alexei.

PS

I am going to buy a cell phone today, the problem seemed to be solved – I bought from them a new SIM card for \$30 :)

Properties Page

Return-path: <natalex@telus.net> Received: from mail.cnwra.swri.edu ([129.162.205.6]) by rogain.cnwra.swri.edu (Sun ONE Messaging Server 6.0 (built Oct 29 2003)) with ESMTP id <0JLT007BM7BD4F30@rogain.cnwra.swri.edu> for opovetko@cnwra.swri.edu; Thu, 26 Jul 2007 18:16:25 -0500 (CDT) Received: from virus89-in.ccf.swri.edu (virus89-in.ccf.swri.edu [129.162.252.35]) by mail.cnwra.swri.edu (Switch-2.2.6/Switch-2.2.6) with ESMTP id I6R0Hel03077 for <opovetko@cnwra.swri.edu>; Thu, 26 Jul 2007 19:17:40 -0500 (CDT) Received: from ccf.swri.edu (localhost [127.0.0.1]) by virus89-in.ccf.swri.edu (8.13.1/8.13.1) with ESMTP id I6QNGJEv028223 for <opovetko@cnwra.swri.edu>; Thu, 26 Jul 2007 18:16:19 -0500 (CDT) Received: from ([199.185.220.224]) by ironmail.ccf.swri.edu with SMTP id 5203032.19598603; Thu, 26 Jul 2007 18:15:56 -0500 Received: from priv-edtnaa05.telusplanet.net ([204.191.232.23]) by priv-edtnes87.telusplanet.net (InterMail vM.7.08.02.00 201-2186-121-20061213) with ESMTP id <20070726231555.THHE14823.priv-edtnes87.telusplanet.net@privedtnaa05.telusplanet.net>; Thu, 26 Jul 2007 17:15:55 -0600 Received: from radprot (unknown [204.191.232.23]) by priv-edtnaa05.telusplanet.net (BorderWare MXtreme Infinity Mail Firewall) with ESMTP id 9EUNCSX2RX; Thu, 26 Jul 2007 17:15:53 -0600 (MDT) Date: Thu, 26 Jul 2007 17:11:16 -0600 From: natalex <natalex@telus.net> Subject: Loading Curve Evaluation for postclosure - Our Proposals To: povetkooleg@hotmail.com, Oleg Povetko <opovetko@cnwra.swri.edu> Message-id: <20070726231553.9EUNCSX2RX@priv-edtnaa05.telusplanet.net> MIME-version: 1.0 X-MIMEOLE: Produced By Microsoft MimeOLE V6.00.3790.0 X-Mailer: Microsoft Office Outlook, Build 11.0.5510 Content-type: multipart/mixed; boundary="----=_NextPart_000_000E_01C7CFA7.FA2C16F0" Thread-index: AcfP2kR3/Bm4Vy/YTICO3VZfZzMgrA== Original-recipient: rfc822;opovetko@cnwra.swri.edu

The present criticality design analysis of fuel assemblies is evaluations of proposal disposal criticality methodology for post closure period to evaluate the required minimum burnup as a function of initial pressurized water reactor (PWR) assembly enrichment that would permit loading of spent nuclear fuel into the 21 PWR waste package with absorber plates - Loading Curve Evaluation. The scope of criticality design analysis covers a range of enrichments from 1.93 (minimal enrichment for the B&W 15x15 assembly design as the most limiting PWR fuel assembly design through 5.0 weight percent U-235, and a burnup range of fresh(0) through 45 GWd/MTU.

Because of the most uncertainties in k-eff estimations for the loading curve evaluation are coming from the burnup calculations, uncertainty analyze has been performed by comparison of k-eff for TAD with a fuel compositions obtained by burnup calculations for a standalone fuel road (traditional approach) and for the whole assembly consists of 208 fuels rods. Accurate time-consuming depletion calculations for an fuel assembly has been performed by the SCALE-5 T-DEPL TRITON sequence that provides additional lattice physics capabilities that are not available in the Monte Carlobased T5- and T6-DEPL sequences, such as the ability to generate lattice physics parameters and perform branch calculations. For instance, T-DEPL provides the option to group independently depleted mixtures together such that they are tracked independently but use a common set of cross sections.

Preliminary depletion analysis allowed dividing all 215 fuel roads into the five group that have almost the same **pin power factors** (available from NEWT approach) for a burnup range of fresh(0) through 45 GWd/MTU (Fig. 1). Other NEWT powerful option allows to performed burnup calculation for a total of 232 nuclides.

Axial burnup profiles obtained from [21-PWR Waste Package with Absorber Plates Loading Curve Evaluation, Document Identifier: CAL-DSU-NU-000006 REV 00B] using 9 axial zones for each of five radial groups with a total of 45 different depleted materials have been inputted for burnup uncertainty estimation for each point of a burnup range. Working with such large arrays of data for MCNP / SCALE-5 input resulted in software designing to increase reliability of obtained data and elimination of "by hand" input of large arrays of data.

Proposal approach estimates burnup calculations uncertainties and can be used as a new method for a loading curve evaluation.

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56	25	25	24	22	21	4	22	24	22	4	21	22	24	25	25	56
56	24	24	22	4	21	21	23	24	23	21	21	4	22	24	24	56
56	24	24	21	21	22	21	23	24	23	21	22	21	21	24	24	56
56	24	23	4	21	21	4	22	23	22	4	21	21	4	23	24	56
56	24	24	22	23	23	22	23	22	23	22	23	23	22	24	24	56
56	24	24	24	24	24	23	22	6	22	23	24	24	24	24	24	56
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Figure 1. 215 fuel roads of an assembly have been divided into the 5 group (21 - 25) according their pin powers during depletion calculations and available from NEWT transport approach