NR

From: Stuart Rubin RES
To: Donald Carlson; John Flack; Ralph Meyer; Thomas King RES
Date: Wed, Oct 31, 2001 8:50 AM
Subject: Fwd: Re: HTR Fuel Elements

FYI.

CC: Amy Cubbage; Undine Shoop

T134

From: Heinz Nabielek <h.nabielek@fz-juelich.de>
To: Stuart Rubin <SDR1@nrc.gov>
Date: Tue, Oct 30, 2001 5:17 PM
Subject: Re: HTR Fuel Elements

Stu,

thanks for the detailed response.

Heiko Barnert will have the final word, but I think that 9-12 spheres can be made available, if your interest is serious enough.

Those spheres from AVR 21/2 are of an unbelievably good quality, better than was known at the time. We also use 3 of them in the European HTR-F program to irradiate up to 20% FIMA (one model calculation predicts disastrous failure at 19.5% FIMA when all free volume between kernel and buffer layer is filled up). At the same time, we will be irradiating 2 Chinese spheres that also seem of good quality (a HTR-F delegation will be visiting China early next year).

How were the fuel and fission product presentations 15-16 October?

Best greetings
Heinz

Stuart Rubin wrote:
>
> Dear Heinz:
>
> I apologize for the delay in responding to your 10/5/01 E-mail to me on the above subject.
>
> Over the course of the last few months the US NRC has had a number of discussions with the U.S. Department of Energy, the Idaho National Engineering Laboratory (e.g., David Petti), Exelon Generation Company (e.g., James Muntz) and the National Nuclear Regulator, RSA (Guy Clapisson) on proposed irradiation testing in the USA of German archive HTR fuel elements and production PBMR pebble fuel that are to be fabricated in South Africa. USNRC discussions on this subject are continuing with all parties.
>
> The USNRC has a strong desire to conduct independent testing of the German fuel under conditions that simulate the PBMR normal operating environment and accident conditions as a means to independently validate the technical basis for the view that the performance of the German HTR reference fuel design in the PBMR environment would be within envelop of the historical performance of the German HTR reference fuel in the AVR and MTR environments previously documented. The USNRC also has a strong interest in testing at least some small number of German HTR fuel (and production PBMR fuel) under conditions that are not expected within the design-analysis envelop of a pebble bed reactor, such as the PBMR. The purpose of the latter testing would be to better understand the limits of fission product

retention of pebble fuel elements with TRISO coated fuel particles under beyond-the-design-basis conditions.
>
> In our discussions with the various parties there appears to be a general consensus that a jointly sponsored and integrated test program would be a worthwhile pursuit. In this regard it seems that there is a core component of such a joint program that would be of common interest to all of the parties. However, the various parties also appear to have special needs and special interests that would require the core to be supplemented to meet these individual needs.
>
> With respect to the NRC's interests, we have discussed with DOE and INEL pre-demonstration baseline validation testing and beyond-the-design-basis performance testing using German fuel pebbles. Such a program at its full extent would involve from 9-12 German fuel pebbles. Irradiation program cost factors, however, may require a scaling back of such a program. At this time we are not sure how much of the costs could be shared and how much would be covered by the NRC and/or DOE.
>
> We are attempting to develop an irradiation test matrix with a core component supplemented by organization-specific fuel performance testing components. Alternative options and cost sharing proposals would then be evaluated in light of the respective organizational needs and budget constraints.
>
> At this point the NRC definitely would like to obtain German reference HTR fuel elements to support the NRC's areas of interest in the evolving irradiation test program plans. Thus, I would like to continue to reserve perhaps German 9-12 fuel elements for these purposes. However, if such numbers are beyond what is possible, I would like to reserve the maximum number of elements that could be made available or the NRC to achieve its test program objectives within the larger integrated program.
>
> I hope this update was useful and thank you for your continued support.
>
> Stuart Rubin, NRC
>
> >>> Heinz Nabielek <h.nabielek@fz-juelich.de> 10/05/01 07:43AM >>>
> At 07:39 10.08.2001 -0400, you wrote:
> >Heinz:
> >
> >The USNRC is beginning to evaluate options for conducting fuel
> irradiation tests on current generation fuel elements with TRISO particle
> fuel. In these initial internal discussion I mentioned that you had
> indicated that some unirradiated fuel that had been fabricated for the AVR
> could be made available to the NRC to include in the US test program. In
> this regard the NRC Office of Nuclear Regulatory Research would very much
> like to enter into discussions with you and any others in Germany with the
> authority to discuss such matters. Based on our preliminary assessments
> NRC would have an interest in obtaining up to 12 of these fuel elements for
> use in these tests.
> >
> >At this point, the purpose of this message is mainly to feedback to you
> our strong interest in obtaining AVR fuel elements. I am therefore
> requesting that you take the initial steps to add NRC/DOE to the list of
> organizations that would like to obtain fresh AVR fuel elements. I trust
> that this request is timely and that we may therefor be able to put a
> "reserve" on some of these elements so that we may have the opportunity to
> followup formally with our request.
> >
> >Thank you for your interest in these matters.
> >
> >Stu Rubin, NRC
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> Stu, we did not talk for some time now.
>
> My fuels presentation 12 September never happened.
> In its place, Karl Verfondern will present the
> material on 15 October.
>
> We made great efforts to reserve some fuel for NRC
> (for whom in the U.S. exactly)-
> see GermanFreshHTRfuel.doc
>
> 16-18 October we have EU HTR-F meetings
> in Karlsruhe (manufacture)
> and Lyon (modelling). David Petti
> will join us in Lyon.
>
> Whats the news from your side?
>
> Heinz

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