

Mendiola, Doris

Subject: FW: comment on draft of RG 1.90 and RG 1.107

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From: Etienne GALLITRE [mailto:etienne.gallitre@edf.fr]

Sent: Monday, May 30, 2011 11:25 AM

To: Graves, Herman

Cc: mathieu.rambach@irsn.fr; francois.tarallo@irsn.fr; Alexis COURTOIS; Cedric ISARD; Frederic COPPEL; Jean-Marc DEBATTISTA; Daniele CHAUVEL

Subject: comment on draft of RG 1.90 and RG 1.107

Hello Herman!

Here you'll find our remarks on the text of RG 1.107 and 1.90 drafts (that is the synthesis of EDF staff only , that is the reason why I give a copy to IRSN specialists)

These are "comments" that make the links between the guides and our practice as it should be!

RG 107 (CEMENT grouting qualification)

the guide is prescriptive and precise for the products themselves, what is a good thing

ASME III div 2 says nothing about the demonstration of the applicant of the grouting operation performance before (mock-up)- after it is too late-

As the ISI possibilities of grouted cables are limited, i think that the NRC document should say some words about the qualification of the grouting operation itself;

We understand that you cannot introduce a too important change now, so it is difficult to write know the word "mock up" (and we cannot write mock-up without describing what it is) but you could perhaps write that the applicant has to demonstrate its capacity to perform an effective grouting considering all the size effects with a void target that cover every construction uncertainties (or some words to explain that the voids of the demonstration are more severe than the ones allowed for the containments).

Of course, the NEA document will describe relatively in detail what is a mock-up (in fact a mock-up series)

The ASME/2007 precise 30 days for the total time of exposure in a non controlled environment and 7 days between tensioning and grouting (we may have more but with temporary protection) but also with time limits: so we can say that this point is covered by ASME

R.G. 1.90 (ISI ...grouted tendons)

Background: it's a very good think to make the link between RG 1.107 and R.G. 1.9: we perhaps could add " the tendons corrosion likelihood strongly depends on the quality of grouting which has to be qualified" (I think NRC position could be less flexible if grouting operation qualification documentation is poor). This point is a background element.

SUNSI Review Complete
Template = ADM-013

E-RDS-ADM-03
1 Add = M. Bayssie (NUMB7)
H. Graves (HL91)
M. Cuel (MJC)

Background, just before "Force Monitoring of UngROUTed Tendons" we could add "Periodic pressure tests are more frequent for alternative B than for alternative A" (which is the case in the figure of the RG); We think this point as a background element is also important.

Our comments correspond to a Alternative A (we have in France alternative A + **analyse of full pressure test containment response in terms of rigidity** and visual inspection)

We are a bit confused with the description of the instrumentation of Alternative A: in the chapter "3.1.1 Installation, section b," the RG recommend to implement sensors in the typical location of figure 3, that is to say near some tendons.

In France we instrument current zones of the dome and cylinder wall , with a high redundancy level: these gauges can effectively be interpreted. We have some doubt about our capacity to interpret gauge distributed "in the concrete" near tendons: it is possible but as the stress diffuse in the structure, the connection between measurement and cable is not obvious"

The NEA report about August 1997 in Civaux say that stress cells in the concrete was deficient (Belgium article): it is possible to measure directly stress in concrete, but it is a difficult task we perform only in special occasions, not for containmant periodic measurements .

So alternative A is very well described in section a

section b could explain which zones has to be monitored (presenting this ones as a minimum which has to be measured during the all life time: that is to say which need redundancy and replaced if needed) . Our minimum locations are for EDF is: Dome (center/ 2 directions) ; Cylinder wall (2 locations/2direction) ; Gouset (2 location/2directions). This minimum locations need a very large redundancy to confirm measurements error, to detect any structure abnormal behaviour if suspected and to manage gauges lifetime. These local instruments are completed by others devices such as invar wire located near the "minimum aeras" for validation.

section c could be modified, only by writting ".. shall...to measured strain, temperature in concrete . This minimum devices can be completed by others intruments to measure stress and other parameters in concrete, bars and tendons. "

Effectively the total numbers of gauges may be 250 to 300 (at the beginning).

section 3.1.3 a: there is a litle ambiguity about the word "interpretation": does it mean that the licensee has to produce a report every 2 month? or he has to produce a report where the data corresponding to a 2 month period are interpreted?

General comment on Alternative B

Just a comment: several containments in France without any loss of rigidity during pressure test have showed a loss of pre-stress in concrete due to concrete creep, it is the reason why we explain to US/EPR staff that it would be better not to have "zero" permanent instrument (minimum with very few redundancy)

Thank you for every informations you gave us during our last meeting!



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