

**From:** Oh, Dirk [mailto:Dirk.Oh@candu.com]  
**Sent:** Thursday, November 01, 2012 4:07 PM  
**To:** Consultation  
**Cc:** Ohn, Myeong-Yong; Shams, Masoud  
**Subject:** RE: Comments on GD-337

Hi:

In case there may be a misunderstanding for the comments below, I would like to clarify that the comments below are nothing to do with Candu Energy, but my personal opinion. To avoid confusion, I should have sent these comments using my personal e-mail address.

Thanks,

Dirk

---

**From:** Oh, Dirk  
**Sent:** October 31, 2012 3:11 PM  
**To:** 'consultation@cnscccsn.gc.ca'  
**Cc:** 'Ohn, Myeong-Yong'; Shams, Masoud  
**Subject:** Comments on GD-337

Hi:

Here is my two cents on Section 8.1.1.1 of GD-337. It is suggested to add the yellow-highlighted/underlined part or similar ones for clarification.

Dirk Oh  
Fuel Engineering Department, Candu Energy  
(905-823-9060 x34688)

#### **8.1.1.1 Fuel design**

Acceptance criteria should be established for fuel damage, fuel rod failure, and fuel coolability. These criteria should be derived from experiments that identify the limitations of the material properties of the fuel and fuel assembly, and related analyses with the fuel design. The fuel design criteria and other design considerations are provided below.

#### **Fuel damage**

Fuel damage criteria should be included for all known damage mechanisms in operational states (normal operation and AOOs). The damage criteria should assure that fuel dimensions remains within operational tolerances, and that functional capabilities are not reduced below those assumed in the safety analysis. When applicable, the fuel damage criteria should consider high burn-up effects based on irradiated material properties data. The criteria should include stress, strain or loading limits, the cumulative number of strain fatigue cycles, fretting wear, oxidation, hydriding (deuteriding in CANDU reactors), build-up of corrosion products, dimensional changes, rod internal gas pressures, worst-case hydraulic loads, and LWR control rod reactivity and insertability.