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Briefing on Incident at Krsko Nuclear Power Plant on 4 June 2008 (Version 2)

Mycle Schneider Paris, 5 June 08

Overview of Events

On 4 June 08 at 15h38 UTC (17h38 local time) the Commission's Emergency response system ECURIE (European Community Urgent Radiological Information Exchange) has received an alert message from Slovenia following a loss of coolant accident at the Krsko Nuclear Power Plant. According to a first Commission statement from early evening, "the Commission immediately transmitted this information to all Member States. The Emergency Team of DG TREN remains posted until further information is received that the situation is fully under control. At the moment of issuing this press release, the power of the reactor was at 22% and the safe shutdown is still in progress."

A second Commission statement (see Annex 1), released late evening on 4 June 08, states that "according to the last information received by the Slovenian authorities, the reactor of the Nuclear Power Plant of Krsko **has been completely shut down at 19h30**" (21h30 local time) and that "the relatively small leakage remained within the containment building. The Slovenian authorities have confirmed that **there has been no discharge to the environment**. The situation can be considered **fully** under control."[1]

The Slovenian Nuclear Safety Administration (SNSA) issued a four-line statement:

> ANNOUNCEMENT - Unusual Event at the Krsko NPP
> There was a water leak from the primary circuit inside the containment at the Krsko NPP today on 4 June 2008. Operators have shut down the plant safely. Situation is under control. The plant is in stable condition. There is no off-site impact and there is no need for off-site protective measures.

According to the French Nuclear Safety Authorities (ASN, see Annex 2), primary coolant loss was identified at the Krsko plant at 15h07 with a 2.4 m^3/h leak rate[2] when the reactor was at full power. The origin was given as a defective primary pump seal. The reactor has been shut down. It will take at least several days before the unit can be repaired and restart operation.

According to the Austrian Government, the Slovakian authorities had initially labelled the event as "exercise". This was confirmed by the Slovakian side that indicated that it had not properly filled out a declaration formula but corrected the mistake later and presented its excuse to the Austrians.

Comments

A leak at a primary pump is a rather common event in a nuclear power plant. The leak rate is intermediate size (not "relatively small" as indicated by the Commission). Depending on the location of the leak, much smaller leak rates are considered unacceptable (several dozen litres per hour in a steam generator leak, for example). On the other hand, much larger leaks do occur occasionally (for

[1] emphasis in the original
[2] The Slovakian operator indicated 2.5 m^3/h during a local press event on 5 June 2008 but otherwise confirmed the indications given by ASN.

example, in May 1998, a primary coolant leak at the French Civaux-2 reactor averaged 30 m^3/h for ten hours until it could be isolated).

A reactor that is shut down is not exempt from risk. Once the control rods are inserted into the core and the reactor is shut down, the remaining power is still about 7% of nominal capacity. In the case of the 700 MW Krsko plant this is equivalent to about 50 MW, which is the size of an entire power plant. The equivalent amount of residual heat has to be removed permanently and safely. It takes several days until the heat level is sufficiently low to intervene on the primary circuit and the nuclear fuel must still remain actively cooled. If the cooling water was drained, the irradiated fuel would spontaneously ignite and burn.

Open Questions

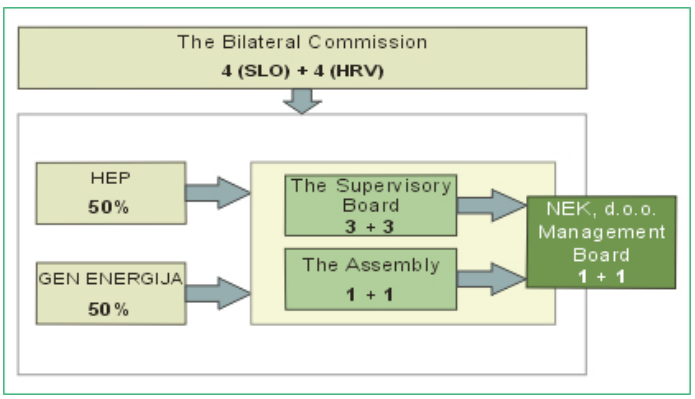
It remains unclear why the ECurie alert was triggered. Several questions remain unanswered:

- What was the specific characteristic of the event that made the Commission launch the EU wide alert?
- What was the exact information provided by the Slovenian authorities to the Commission and other safety authorities?
- Why is the information provided by the French authorities to the public more detailed and precise than the information provided by the Commission?
- What was the cumulated amount of cooling water that was leaked and when was the leak effectively isolated?
- How many times has the Commission been informed within the framework of ECURIE since its establishment?
- How many times has the Commission launched the ECURIE alert?

Background on Krsko

The Krsko Nuclear Power Plant is a Westinghouse designed and built reactor with a net capacity of 666 MW (gross 730 MW). It is jointly owned by the Slovenia GEN Energija and the Croatian HEP and operated by Nuklerana Elektrarna Krsko (NEK).
"The basic capital of NEK is divided into two equal shares owned by the partners GEN energija l.l.c. Ljubljana and Hrvatska Elektropriveda p.l.c., Zagreb. NEK produces and supplies electricity exclusively in favour of the two partners, who each have the right and obligation to use 50% of its total output."[3]

Figure 1: The Krsko Management



Source: NEK 2008

Construction of the reactor started in 1975 and it was connected to the grid on 2 October 1981. Its performance has been increasing constantly and it reached an excellent 93% load factor in 2007.

[3] http://www.nek.si/en/about_nek/management/

Annex 1: Press Release European Commission

IP/08/859

Brussels, 4 June 2008

UPDATE 2 ON Krsko. Slovenian authorities inform. Reactor is completely shut down. Leak confined. Situation fully under control

For the sake of transparency, the Commission has informed earlier today about the alert message from Slovenia at 17h38 local time about the loss of coolant that has occurred in the primary cooling system of the Krsko Nuclear Power Plant. The Krško Nuclear Power Plant is located in Krško, in South-West Slovenia.

According to the last information received by the Slovenian authorities, the reactor of the Nuclear Power Plant of Krsko **has been completely shut down at 19h30**. The relatively small leakage remained within the containment building. The Slovenian authorities have confirmed that **there has been no discharge to the environment**. The situation can be considered **fully** under control.

The Commission immediately transmitted this information to all Member States.

The European Community Urgent Radiological Information Exchange (ECURIE) system is the technical implementation of the Council Decision 87/600/Euratom on Community arrangements for the early notification and exchange of information in the event of a radiological or nuclear emergency. This 87/600 Council Decision requires from the ECURIE Member States that they promptly notify the European Commission (EC) and all the Member States potentially affected when they intend to take counter-measures if necessary in order to protect their population against the effects of a radiological or nuclear accident. The EC needs to immediately forward this notification to all Member States. Following this first notification, all Member States are required to inform the Commission at appropriate intervals about the measures they take and the radioactivity levels they have measured. All the 27 EU Member States as well as Switzerland have signed the ECURIE agreement.

There is an agreement with the IAEA to exchange notifications by fax with their early notification system ENATOM.

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Annex 2: Press Release French Nuclear Safety Authorities (ASN)

Paris, le 04 juin 2008

COMMUNIQUÉ DE PRESSE

Incident à la centrale nucléaire de Krsko (Slovénie) : l'ASN en contact avec son homologue slovène (22 h 10)

L'ASN a été informée, aujourd'hui 4 juin 2008, à 17 h 38, par le système de notification de l'Union européenne (ECURIE), de la survenue d'un incident, à 15 h 07, à la centrale nucléaire de Krsko, située en Slovénie.

L'ASN a contacté le responsable de l'Autorité de sûreté nucléaire slovène (SNSA). Celui-ci a fourni les informations suivantes :

- une fuite d'un débit de 2,4 m3/h s'est produite sur le circuit primaire principal du réacteur en fonctionnement à pleine puissance ;
- la fuite est contenue dans l'enceinte de confinement ;
- il n'y a pas de rejet dans l'environnement ;
- le réacteur a été immédiatement mis à l'arrêt conformément aux procédures normales ;
- les investigations menées par l'exploitant ont permis de localiser la fuite sur un joint d'une pompe primaire ;
- la mise en place d'une organisation d'urgence n'a pas été jugée nécessaire ;
- la réparation nécessitera plusieurs jours.

Ce réacteur est l'unique réacteur de puissance slovène. C'est un réacteur à eau sous pression de conception Westinghouse, d'une puissance de 700 MWe et co-exploité par la société slovène ELES-GEN et la société croate HEP.

ECURIE est un système de notification géré par l'Union Européenne qui permet à un Etat d'informer les états membres.

L'ASN se tient informée en permanence sur l'évolution de cet incident et reste mobilisée.

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