

*Answers to Questions and Comments  
Raised by Hungary  
on the  
National Report of the Czech Republic*



prepared for the purposes of the  
**First Review Meeting of Contracting Parties**  
to the  
**Convention on Nuclear Safety**  
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***HUNGARY 1: What is the status of the operational license extension of Unit 1 of Dukovany NPP?***

After comprehensive safety re-assessment after 10 years of operation NPP Dukovany Unit No.1 has operational license limited till the year 2000.

**HUNGARY 2: What are the exact safety enhancement programs, and time-schedules of the Dukovany and Temelin NPPs ?**

**NPP Dukovany**

The Nuclear Power Plant Dukovany is paying prime attention to safety enhancement, i.e. to the „IAEA Safety Issues“ resolution. The first safety enhancements have been included in the so-called „NPP Dukovany backfitting programme“ specified by the Government Resolution No. 309 of 1986. Still before the IAEA-EBP WWER-03 was put in words, a so-called „Minimum List of Measures to Enhance Nuclear Safety of VVER 440/213 Blocks“ had been brought about within the framework of the VVER 440/213 club. The „IAEA Safety Issues“, arisen thereafter, contain a variety of recommendations from this List. The safety aims of the NPP Dukovany voiced today in the upgrading program under the name of „MORAVA“, have been passed through judgement by the IAEA mission on the basis of the IAEA-EBP-WWER-03 document prepared in 1995.

It can be summarized that all of the „Safety Issues IAEA“, categorized II and III, have been included in the upgrading program by the Nuclear Power Plant Dukovany. The "operational" issues stated in the IAEA-EBP-WWER-03 document (13 uncategorised recommendations) is placed under discussions at the NPP Dukovany on separate basis and its level shall be subject to inspection by the repeated OSART mission in 2001. For an outline of the individual safety issues sorted out or being just prepared see the table below.

It is obvious from the graphic information, that the NPP Dukovany intends to gradually resolute altogether 74 identified Safety Issues (categorized I, II, and III).

Until early 1999, 31 measures have been implemented in total, 16 of them in category II and 1 in III.

Of the total number of 40 measures categorized II, 31 will be accomplished by 2002 and as for the 8 findings of IAEA in the category III, all will be realized by the same year. The remaining actions in the category II go hand in hand with implementation of the activity called „Instrumentation and Control System Modernization“. This year in late March, the ČEZ, a.s. made official announcement to the potential contractors to compete for implementation of the Instrumentation and Control System Modernization project.

**Schedule of IAEA Safety Issues resolution**

Year	Number of Finding	Count per Year	Total	I	II	III
Cont.	AA1 (II), AA2 (I), AA3 (II), AA10 (I)	4	4	2	2	-
by 1998	G3 (II), CI1 (II), CI2 (III), CI4 (II), CI5 (II), CI6 (I), S6 (II), S7 (II), S8 (I), IaC8 (II), EI1 (I), C3 (II), C4 (II), C5 (I), IH1 (II), IH5 (I), AA4 (I), AA7 (II), AA12 (I), AA13 (I), AA14 (I), AA15 (I), IH8 (I), EH3 (III)	24	28	11	11	2
1998	G1 (II), S15 (II), IH3 (II)	3	31	-	2	-
1999	AA5 (I), AA8 (II), G2 (III), EH1 (III)	4	35	1	1	2

2000	S12 (I), EI5 (II), IH4 (II), AA11 (I), S1 (II), S4 (II), S5 (III), S13 (III), C2 (II), IH2 (III)	10	45	2	5	3
2001	S11 (I), S16 (II), RC1(II)	3	48	1	2	-
2002	S3 (II), S9 (II), S10 (II), S17 (II), IaC11 (I), EI2 (I), EI3 (I), EI4 (I), AA6 (II), IH7 (III)	10	58	4	5	1
2003	IaC10 (II), IaC6 (I), IaC7 (II),	3	61	1	2	-
2004	CI3 (II)	1	62	-	1	-
2006	S14 (II)	1	63	-	1	-
2007	S2 (II), IaC1 (II), IaC2 (I), IaC3 (II), IaC4 (II), IaC5 (II), C1 (II)	7	70	1	5	-
2009	IaC9 (II)	1	71	-	1	-
2010	AA9 (I)	1	72	1	-	-
Not planned	IH6 (I), EH2 (I),	2	74	2	-	-

## Temelín

The extent to which the recommendations from the IAEA-EBP-WWER-05 Report had been implemented was assessed by the specialized Committee of IAEA in March 1996. In summary, it can be stated that most of these recommendations had been fulfilled at that time already or were then in an advanced stage of realization, this being documented in the Summary Report from this IAEA mission called “Reviews of WWER-1000 Safety Issues Resolution at Temelín NPP, WWER-SC-171“.

Issue Number	Issue Designation	Note
<b>GENERAL</b>		
G1	Component classification	is being addressed
G2	Equipment qualification	is being addressed
G3	Reliability analysis of the safety system class 1 and 2	addressed
<b>REACTOR CORE</b>		
RC1	Prevention inadvertent of boron dilution	addressed
RC2	Control rods insertion reliability /fuel elements deformation	addressed
RC3	Sub-critical status monitoring during reactor shutdown	addressed
<b>COMPONENT INTEGRITY</b>		
CI1	RPV embattlement and its monitoring	addressed
CI2	Non-destructive tests	addressed
CI3	Primary pipeline whipping restrain	is being addressed
CI4	Steam generator collector integrity	addressed
CI5	Stem generator tube integrity	addressed
CI6	Steam and feedwater piping integrity	is being addressed
<b>SYSTEMS</b>		
S01	Primary circuit cold overpressure protection	addressed
S02	Mitigation of a steam generator primary collector break	addressed
S03	Reactor coolant pump seal cooling system	addressed
S04	Pressuriser safety and relief valves qualification for water flow	addressed
S05	ECCS sump screen blocking	addressed
S06	ECCS water storage tank and suction line integrity	addressed
S07	Heat exchanger integrity	addressed
S08	Power operated valves on the ECCS injection lines	addressed
S09	Steam generator safety and relief valves qualification for water flow	addressed
S10	Steam generator safety valve's performance at low pressure	addressed
S11	Stem generator level control valves	addressed
S12	Emergency feedwater makeup procedures	addressed
S13	Cold emergency feedwater supply into steam generators	addressed
S14	Main control room ventilation system	addressed
S15	Hydrogen removal system	addressed

Number of Issue	Issue Designation	Class of Issue
<b>MEASUREMENT AND CONTROL</b>		
I&C01	I&C reliability	addressed
I&C02	Safety system actuation design	addressed
I&C03	Automatic reactor protection for power distribution and DNB	addressed
I&C04	Human engineering of control rods	addressed
I&C05	Control and monitoring of power distributions in load follow mode	addressed
I&C06	Condition monitoring for the mechanical equipment	addressed
I&C07	Primary circuit diagnostic systems	addressed
I&C08	Reactor vessel head leak monitoring system	addressed
I&C09	Accident monitoring instrumentation	addressed
I&C10	Technical support center	addressed
I&C11	Water chemistry control and monitoring equipment (primary and secondary)	addressed
I&C12	Automatic reactor protection for power and DNB	addressed
I&C13	Power distribution monitoring inside the active zone in load follow operation	addressed
I&C14	Power supply to the plant process computer and I&C systems	addressed
<b>ELECTRIC POWER SUPPLY</b>		
E12	Reliability of diesel-generators	addressed
E13	Protection signals for emergency diesel-generator	addressed
E14	On-site power supply for incident and accident management	addressed
E11	Off-site power via start-up transformers	addressed
E16	Ground faults in DC circuits	addressed
E15	Emergency battery discharge time	addressed
<b>CONTAINMENT</b>		
Cont. 1	Containment by-pass	addressed
<b>INTERNAL RISKS</b>		
IH1	Systematic fire hazard analysis	addressed
IH2	Fire prevention	addressed
IH3	Fire detection and extinguishing	addressed
IH4	Mitigation of fire effects	addressed
IH5	Systematic analysis to floods	addressed
IH6	Flood protection of the emergency electric switchgear	addressed
IH7	Protection against the dynamic effects of main steam and feedwater line.	is being addressed
IH8	Polar crane interlocking	addressed

<b>Issue Number</b>	<b>Issue Designation</b>	<b>Issue Class</b>
<b>EXTERNAL RISKS</b>		
EH 1	Seismic designs	addressed
EH 2	Analysis to plant specific natural external conditions	addressed
EH 3	Man induced external events	addressed
<b>ACCIDENT ANALYSIS</b>		
AA01	Scope and methodology of accident analysis	addressed
AA02	QA of plant data used in accident analysis	addressed
AA03	Computer code and plant model validation	addressed
AA04	Availability of accident analysis results for supporting plant operation	addressed
AA05	Main steam line break analysis	addressed
AA06	Overcooling transients related to pressurized thermal shock	addressed
AA07	Steam generator collector rupture analysis	addressed
AA08	Accidents under low power and shutdown (LPS) conditions	addressed
AA09	Severe accident	addressed
AA10	Probabilistic safety assessment (PSA)	addressed
AA11	Boron dilution accidents	addressed
AA12	Spent fuel cask drop accidents	addressed
AA13	Anticipated transients without scram (ATWS)	addressed
AA14	Total loss of electric power	addressed
AA15	Total loss of heat sink	addressed
<b>OPERATION</b>		
OP1	Procedures for normal operation	addressed
OP2	Emergency Operating Procedures	addressed
OP3	Limits and Conditions	addressed
Man1	Need for Safety Culture	addressed
Man2	Experience feedback	addressed
Man3	Quality Assurance Program	addressed
Man4	Data and document management	addressed
PO1	Philosophy on use of procedures	addressed
PO2	Surveillance programme	addressed
PO3	System of communications	addressed
RP1	Radiation protection and monitoring	addressed
Tr1	Training programs	addressed
EP1	Emergency center	addressed

Presently valid schedule for first fuel loading (unit No. 1) is August 2000. By that time all remedial measures should be implemented and approved.

In order to evaluate the state of fulfillment of the recommendations under IAEA-EBP-WWER-05, the NPP Temelín has entered a contract with an engineering/consulting company. The purpose is the detailed analysis of the works done so far, with the goal to timely identify any potential drawbacks in the existing solution.