INPRO Dialogue Forum on Nuclear Energy Innovations: Multilateral Approaches to Sustainable Nuclear Energy Deployment – Institutional Challenges

Experience from sharing of the Krsko NPP between Croatia and Slovenia

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♦ Joint ownership model of the Krško NPP – from the beginning to today

♦ Liabilities for decommissioning of the Krško NPP, spent fuel and waste management

♦ Status of negotiations between co-owners on liabilities for disposal of spent fuel and nuclear waste and major obstacles

♦ Current status of NPP Krško
Former Yugoslavia

Socialist Federal Republic of Yugoslavia

Gross National Product (GNP):
Estimated at US$120.1 billion in 1990

Yugoslavia's population
23.4 million

Federal system in which federal government and governments of six republics shared power and authority.

Yugoslav system had developed into a unique, highly decentralized, socially owned market economy.

Total Electricity Net Consumption 1984:
62,905 GWh
Croatia and Slovenia from 1991 to today

Slovenia
Population: 2 005 692
GDP (official exchange rate): $49.22 billion
Electricity - consumption: 14.7 billion kWh

CROATIA
Population: 4,489,409
GDP (official exchange rate): $63.19 billion

Electricity consumption in Croatia
1984: 13 689 GWh
2009: 17 697 GWh

Electricity generation capacity: 3889 MW + NEK 348 MW

Electricity consumption in Croatia
1984: 13 689 GWh
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Electricity generation capacity: 3889 MW + NEK 348 MW
Joint ownership model of the Krško NPP - history

♦ Foundation of the Krško NPP – the 1970 Agreement

— Result of energy shortages in Yugoslavia in the 1970s

— Croatia and Slovenia agreed to found the Krško NPP for which they would share the financial responsibility in return for the benefit of cost price produced by the plant

— Decision was embodied in the Agreement between the Socialist Republic of Croatia and Socialist Republic of Slovenia, dated 27 October 1970 (the 1970 Agreement)

— The 1970 Agreement was the first evidence of the nature of the relationship between Slovenia and Croatia
Joint ownership model of the Krško NPP

♦ Foundation of the Krško NPP – the 1970 Agreement

— The 1970 Agreement set out the legal framework for Slovenia and Croatia’s mutual operation and investment in the Krško NPP
— This joint relationship continues throughout the history
— Main principle of the 1970 Agreement is the principle of equality between Slovenian and Croatian investors in all aspects of the joint project:
  - The Republics deem that the joint investors from both Republics should participate in financing of construction of the joint nuclear power plant in equal parts and that their rights and liabilities should reflect such equal parts.
  - The same principles should apply in establishing the rights and obligations during the operation of the joint nuclear power plant.
Joint ownership model of the Krško NPP

♦ Foundation of the Krško NPP – the 1970 Agreement

– The Republics also agreed that two NPP were to be built jointly, the first would be built in Slovenia and the second in Croatia

  – The Republics agree and understand that the first joint nuclear power plant shall be of 600 MW capacity, and its location shall be in Slovenia, as anticipated on the territory of Krško.

  – The Republics agree and understand that, after the construction of a nuclear power plant on the territory of Slovenia under the principles and terms as established herein, another joint nuclear power plant shall be built on the territory of Croatia
Joint ownership model of the Krško NPP

♦ Foundation of the Krško NPP – the 1970 Agreement
   – The 1970 Agreement also diminish influence of domestic legislation
     – the Republics agree and understand that, in the case the economic measures and instruments are introduced in any of the two Republics, which adversely affect the construction or use of the joint nuclear power plant, as compared to the conditions in force at the beginning of its construction, such measures and instruments shall not have any effect on the rights and liabilities of the investors from the other Republic.
Joint ownership model of the Krško NPP

Foundation of the Krško NPP – the 1974 Pooling Agreement

— With the beginning of the NPP construction, on 22 March 1974, investors – electric companies of Croatia and Slovenia executed the Agreement on Pooling of Resources for Joint Construction and Joint Exploitation of the Krško NPP (the 1974 Pooling Agreement).

— The bulk of the 1974 Pooling Agreement is devoted to a detailed delineation of the Parties' agreements with respect to:
  - the financing of Plant construction and
  - the organization of Nuklearna elektrana Krško, p.o., the joint venture company formed under Slovenian law to operate the Plant.

— Evident throughout these provisions is the vital importance of the "parity principle"
Joint ownership model of the Krško NPP

♦ Foundation of the Krško NPP – the 1982 Annex

— Construction of the plant commenced in 1974 and it was completed in 1981
— The 1982 Annex to the 1974 Pooling Agreement updated the 1974 Pooling Agreement and brought it into conformity with Associated Labor Act
— The 1982 Annex didn’t change any provision in respect to the basic structure of joint venture relationship that had been established in the 1974 Agreement
Joint ownership model of the Krško NPP

♦ Foundation of the Krško NPP – the 1982 Self-Management Agreement

— The 1982 Self Management Agreement was executed on April 16, 1982 between Croatian and Slovenian electric companies and Krško NPP

— Described the mutual rights and liabilities of co-founders and the Krško NPP

— Provided more details of the structure, role and governance of the plant

— Defined the method by which the price to be charged for electricity production at the Krško NPP
Joint ownership model of the Krško NPP

♦ Foundation of the Krško NPP - additional remarks

— *Four agreements were conclude* between two Republics, their electric companies and the Krško NPP – the Governing Agreements

— All agreements should be understood and interpreted within the context of the social political and legal regime in place in Yugoslavia at the time of its enactment

— The Krško NPP had *no owners* and was managed by its workers

— Despite the fact that the Krško NPP was built in the social regime, *ownership relations were based on the capital-relation principle similar to one for joint construction of a nuclear power plant between Belgium and France*
Dealing with the radioactive waste, spent nuclear fuel and decommissioning issue

- The Governing Agreements did not expressly deal with financing of decommissioning at the end of the Krško NPP useful life (2032)
- Spent nuclear fuel and radioactive waste provisions:
  - The Parties shall take all measures to provide, upon completion of construction of the Krško NPP, the security measures for prevention of possible adverse consequences for the human environment
  - The cost of performance of measures from the previous paragraph, together with the cost arising from disposal of nuclear fuel and radioactive waste shall be borne by the Parties from each Republic in proportion 50:50.
- No timescale for performance and financing of such activities

- The Krško NPP was synchronized to the Slovenian national (Yugoslavia) grid in October 1981, commercial operation commenced in January 1983.

- The total joint investment cost US$ 1,201,952,300 – in line with typical construction costs of other contemporaneously built NPP.

- The Krško NPP was operating without serious problems, with full respect of the provisions from the Governing Agreements.

♦ Moratorium on the construction of new nuclear plants

— 1986 Chernobyl disaster dropped the overall public acceptance of nuclear energy
— Croatian Parliament postponed the decision on the construction of its first NPP, according to the provision from 1970 Agreement
— on 20 November 1987 Slovenian Parliament adopted Moratorium on the Construction of Nuclear Power Plants until the Year 2000
— on 24 December 1987 such moratorium also adopted Federal Parliament of Yugoslavia
— Croatian Electric Companies lost 16,7 mln DEM and also lost the economic and social benefits that would have resulted from joint construction of a second nuclear power plant in Croatia.
Slovenian and Croatian Independence

1993-2002: Decade of Disputes
On June 25, 1991, the Republics of Slovenia and Croatia both declared their independence from former Socialist Federal Republic of Yugoslavia.

Differences regarding legal status and application of Governing Agreements began to emerge.

Slovenia suggested that it was not bound by the legal commitments made by Socialist Republic of Slovenia in the Governing Agreements.

The Government of Slovenia named itself the legal successor to the Slovenian co-investors in the Krško NPP.

Croatian electric companies were consolidated to form Hrvatska Elektroprivreda (HEP), a State-owned electric company.
1993-2002: Decade of Disputes

♦ Differences in the common understanding of Governing Agreements produced numerous disputes between the Parties
1993-2002: Decade of Disputes

Main disputable issues for HEP and Croatia were:

- Reduced rights for employment of Croatian workers
- Participation of the Croatian managers in the Krško NPP senior level management
- HEP’s participation in the steam generators replacement project
- Application of different accounting standards for HEP and for Slovenian stake
- Slovenian insistence on HEP’s contribution into Slovenian Decommissioning Fund
Main disputable issues for Slovenia:

- HEP’s failure to pay for the electricity it received from the Krško NPP
- HEP’s refusal to contribute to the Slovenian Decommissioning Fund
- HEP’s refusal to approve all projects from the modernization programme
- Amount of pooled depreciation, ...
1993-2002: Decade of Disputes

Disputes culminated on July 30, 1998

— The Government of Slovenia, Slovenian transmission company ELES, and the Krško NPP disconnected transmission lines from the Krško NPP to Croatia and terminated all deliveries of electricity from Krško NPP to HEP.

— The Government of Slovenia issued a Decree on the Transformation of the Krško NPP in line with Slovenia’s new company laws.

— The Decree provided that it shall remain in force until the entry into force of a new Bilateral Agreement between Slovenia and Croatia.
1993-2002: Decade of Disputes

Intensive negotiations

— Slovenian recent actions motivated two governments to start with a new set of negotiations on the new Bilateral Agreement

— Negotiations were carried out from August 1998 to July 2001

— The new Agreement Between the Government of the Republic of Croatia and the Government of the Republic of Slovenia on Regulation of the Status and Other Legal Relations Regarding the Investment, Use and Dismantling of Nuclear Power Plant Krško (2001 Agreement) was finally signed on December 19, 2001
2001 Agreement

Entry into force

- The expectations on both sides were that the ratifications of the 2001 Agreement would be not later than June 30, 2002
- Unfortunately, both Parliaments delayed with ratification:
  - Croatia ratified the 2001 Agreement on July 3, 2002 and Slovenia more than 7 months later, on February 25, 2003
  - The 2001 Agreement entered into force on March 11, 2003
- The resumption of electricity deliveries from the Krško NPP occurred on April 19, 2003, almost 5 years after 1998’s cut off.
2001 Agreement

Most significant features

- The ECT and the 1970 Agreement

  The recitals state that the Agreement is based, *inter alia*, on the Energy Charter Treaty and the 1970 Agreement.

- The Other Governing Agreements

  The recitals further state that the Governments of Croatia and the Slovenia "took into the account" the Governing Agreements.
2001 Agreement

Most significant features

HEP and ELES GEN: Legal Successors to the Original Investors

Article 1 (a) expressly recognizes HEP and ELES-GEN as the legal successors in interest to the Slovenian and Croatian electrical power companies that invested in equal parts for the construction of the Plant, and (b) provides that HEP and ELES-GEN would "exercise their rights and obligations regarding the management and use of jointly owned NPP in equal parts and in equal proportions, unless otherwise established in this Agreement."

HEP and ELES GEN: 50:50 Shareholders

Article 2 establishes HEP and ELES-GEN as 50:50 shareholders in the Krško NPP, a new legal entity which was to be organized in accordance with and governed by a Memorandum of Association (Exhibit 1 to the 2001 Agreement) to be entered into by HEP and ELES GEN.
2001 Agreement

Most significant features

Governance of the Krško NPP

The designated "Company bodies" would be the Shareholders' Assembly, the Supervisory Board, and the Management Board, "all of which are composed on a parity basis.

50:50 Rights to Total Power Output of the Krško NPP

The Krško NPP is required to deliver electricity produced at the Plant to the Shareholders in equal proportions.
2001 Agreement - Management

The Bilateral Commission
4 (SLO) + 4 (HRV)

HEP 50% → The Supervisory Board 3 + 3 → NEK, d.o.o. Management Board 1 + 1

GEN ENERGIJA 50% → The Assembly 1 + 1
The Management Board is in charge of business operations, and business policy to ensure safe, reliable and competitive operation as well as public acceptability.

The Structure of the Management Board is based on the parity principle considering equal business shares of both partners.

The Management Board, which in principle takes decisions by consensus, consists of two members – the President is nominated by the Slovenian partner and the Member by the Croatian partner.
2001 Agreement

Most significant features

- **Decommissioning, Radioactive Waste and Spent Nuclear Fuel (Article 10 and 11)**

  The parties agreed that dismantling the Plant and disposal of radioactive waste and spent nuclear fuel would be joint liabilities of both Slovenia and Croatia and would be financed in equal proportions (more detailed discussion is following)

- **"Past Financial Issues"**

  Article 17 provides that "mutual financial relations existing up to the signing of this Agreement between NEK, d.o.o., ELES d.o.o., ELES GEN d.o.o., and HEP d.d. shall be regulated in accordance with the principles set forth in Exhibit 3 of this Agreement."
Ownership model

— The NPP Krško is limited liability company based on the capital relationship of Croatian and Slovenian investors

— The company operates based on the principle of covering of all expenses – in principle does not produce either losses or profits as a result of its operation
2001 Agreement

- Disposal of radioactive waste and nuclear spent fuel from plant operation and decommissioning shall be carried out in accordance with the Decommissioning program of radioactive waste and nuclear spent fuel.

- Decommissioning program shall be developed in accordance with international standards and co-operation of NEK, d.o.o. by expert organizations, which shall be appointed by Contracting Parties.

- Decommissioning program shall include among other: proposal for possible sharing and acceptance of both radioactive waste and nuclear spent fuel, acceptance criteria for disposal, assessment of necessary funds, and completion dates.
Decommissioning program
Decommissioning program

- Decommissioning program shall be confirmed by Interstate Commission approved by Slovenian Nuclear Safety Authority, competent for nuclear safety. Decommissioning Program shall be revised at least every five years.

- Location of NEK can be used for interim storage of radioactive waste and nuclear spent fuel for the plant lifetime.

- Program was adopted by Croatian parliament

- Program assumed one repository for all LILW from NEK.
Decommissioning program

If Contracting Parties fail to agree on a common solution about disposing radioactive waste and nuclear spent fuel until the end of plant lifetime, they are both bound to complete acceptance and transport of both radioactive waste and nuclear spent fuel from location of NEK, each half of it, in the period of two years following this time limit.
Decommissioning program

♦ Contracting Partners bind themselves to provide funding for Decommissioning Program development, its implementation in equal shares.

♦ If Contracting Partners agree on a joint decision on disposal of radioactive waste and nuclear spent fuel, these expenses shall also be covered in equal shares.

♦ If such an agreement is not reached Contracting Parties shall independently cover the expenses of all the activities of Decommissioning program implementation.
Revision of Decommissioning program

♦ New revision of Decommissioning program is now under way

♦ Purpose of Revision 2 of DP
  — incorporate relevant developments since the 1st revision into DP modules and scenarios,
  — improve the level of details and reliability of DP, both technically and financially, and
  — propose updated and more accurate cost estimates and appropriate financing models.

♦ The Program will develop and evaluate scenarios based on two options of the NPP Krško (NEK) operation:
  a) as presently planned, until the year 2023,
  b) with lifetime extension until 2043.
Arbitration against Slovenian Government

HEP d.d. request compensation for delay in electricity delivery
Arbitration against Slovenian Government

♦ Due to Slovenian delay in the electricity resumption, in late 2005, HEP d.d. commenced arbitration against Slovenian Government before International Centre for Settlement of Investment Disputes (ICSID) in Washington seeking compensation for the period of delay (June 30, 2002 – April 19, 2003)
## Original Arbitration Proceeding

<table>
<thead>
<tr>
<th>Date</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 28, 2005</td>
<td><strong>The Acting Secretary-General registers a request for the institution of arbitration proceedings.</strong></td>
</tr>
<tr>
<td>April 20, 2006</td>
<td><strong>The Tribunal is constituted.</strong> Its members are: David A.R. Williams (New Zealand), President; Charles N. Brower (U.S.); and Jan Paulsson (French).</td>
</tr>
<tr>
<td>July 03, 2006</td>
<td>The Tribunal holds its first session in London.</td>
</tr>
<tr>
<td>November 13, 2006</td>
<td>The Claimant files a memorial on the merits.</td>
</tr>
<tr>
<td>February 15, 2007</td>
<td>The Tribunal issues a decision joining jurisdiction to the merits.</td>
</tr>
<tr>
<td>April 21, 2008</td>
<td>The President of the Tribunal holds a pre-hearing conference with the parties by telephone.</td>
</tr>
<tr>
<td>May 05-16, 2008</td>
<td>The Tribunal holds a hearing on jurisdiction and the merits in Paris.</td>
</tr>
<tr>
<td>November 24, 2008 - November 25, 2008</td>
<td>The Tribunal holds a hearing in Paris on treaty interpretation.</td>
</tr>
<tr>
<td>July 27 - August 31, 2009</td>
<td>The Tribunal holds a hearing <em>on quantum</em> and certain merits issues in Paris.</td>
</tr>
<tr>
<td>October 05, 2009</td>
<td>The parties file post-hearing briefs.</td>
</tr>
<tr>
<td>November 06, 2009</td>
<td>The parties file reply post-hearing briefs.</td>
</tr>
<tr>
<td>November 13, 2009</td>
<td>The parties file statements of costs.</td>
</tr>
<tr>
<td>November 25, 2009</td>
<td>The Respondent files reply statement of costs.</td>
</tr>
<tr>
<td></td>
<td><strong>Waiting for decision – maybe at the end of 2010.</strong></td>
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</tbody>
</table>
Summary and some observations


History of NPP Krško

♦ **1970**: First agreement between Yugoslav republics Slovenia and Croatia: 50:50

♦ **1974**: Start of NPP Krško construction

♦ **1. 1. 1983**: Start of commercial operation

♦ Mid eighties: Attempts to go for the second unit in Croatia – failed

♦ **1991** – separation from Yugoslavia: two new States established

♦ **1991-95**: Green Government in Slovenia – pressure to close NPP

♦ **1991-98**: Disputes SLO-CRO – irregular payments, financial problems
History - continued

♦ **1998**: Slovenia stopped delivery of electricity to Croatia!

♦ **2000**: Modernization – new Steam Generators, power increase

♦ Financial claims from both sides!

♦ **2001**: Treaty about the ownership reached
  – Financial settlement
  – Ownership 50:50
  – Composition of the Management Board (2 members, Slovenian has veto right in safety issues)
  – Radwaste and Decommissioning issues
History - continued

♦ Croatian parliament ratified in July 2002, Slovenian 8 months later in February 2003 - 2001 Agreement

♦ The 2001 Agreement entered into force on March 11, 2003

♦ April 19, 2003 - The resumption of electricity deliveries from the Krško NPP, almost 5 years after 1998’s cut off.
History - continued

- Croatia claims financial compensation for electricity not delivered between July 2002 – March 2003 – several tens of millions of US$

- In 2005 Arbitration in Washington – very expensive and still in process
BUT in same time

Where we are now and how Krško NPP operate?
Where we are now?

- The Krško NPP has been achieving excellent business results in last few years
- Current disputes arose from the past are expected to be solved this or next year
- The Krško NPP is in very good financial health
- The Krško NPP is the high profitable energy source for both co-owners today
Where we are now?

♦ Operation of NPP runs well

- Krško belongs among the first quarter of NPPs in the world according to its performance records
- Both owners understand peculiarities of the nuclear facility
- Bear 35 M€ approved yearly for upgrades
- Financial discipline perfect – no delays in payments
- Already agreed business plan for 2011 and approved long term investments plan for the next 5 years
- The operator can operate!
- Both owners can enjoy benefits of low cost electricity!
Unit Capability Factor

NEK GOAL 2009: ≥ 90%

YEAR

PERCENT

1991 1993 1995 1997 1999 2001 2003 2005 2007 2009

86,87 82,10 88,27 84,73 88,45 91,75 91,35 98,55 98,59 90,49

69,19 85,09 89,54 82,34 91,15 90,75 98,59 89,59 90,49 90,49

69,47

86,87 82,10 88,27 84,73 88,45 91,75 91,35 98,55 98,59 90,49

25 50 75 100
Forced Loss Rate
Industrial Safety Accident Rate

YEAR

VALUE PER 200 000 MAN-HOURS WORKED

NEK GOAL 2009: ≤ 0,40

1991 1993 1995 1997 1999 2001 2003 2005 2007 2009

1,06 1,95 1,41 0,96 0,97 0,96 0,98 1,12 0,38 0,19

0,62 0,21 0,42 0,00 0,00
Just now this year new record of continues operation – 514 days (previous record was 510 days)

Most important that:

• Management of NPP and
• Owners of NPP

Fully understand NUCLEAR SAFETY CULTURE and SPECIFICITY OF NPP
Future - CROATIA IN EU

Changes in some rules

After Croatia join EU some changes (procurement of goods and services, employment of workers etc.)
Some remarks

Possible difficulties
Some remarks

- Decommissioning
- Funds
- Waste storage
- Price of electricity
- Employment of personnel

- Does improve security of supply for not-host countries?
  - Cross-border capacities – auctions
  - Long term contracts and electricity markets?
Decommissioning Funds and LILW disposal

 Disorder Funds in each country or one fund

 - Large amount of money for long period
 - Benefits from fund money – investment policy

 Disorder One waste disposal

 - Not only for specific NPP?
  - Costs?
  - Size?
  - Taxes?
  - Payment to local community?
  - VAT

 Disorder Or in each country – more expensive!?
Some remarks

- Comprehensive and detailed contracts because of long operation time of NPP
- Relatively well-balanced obligations and benefits for all sides
- Business model: — profit or — non-profit for NPP
- Needed Experts that follow operation of NPP
Compensations to local communities (CLC)

- In Slovenia, direct financial compensations to local communities (CLC) for hosting nuclear facilities as compensations for restricted land use are specified by a government regulation, which was first introduced in 2003 and later amended in 2008.

- Article 136 defines that the beneficiary of compensations is the local community where the area of limited land use is situated.

- The compensations are paid “as compensation for reduced financial resources in the community and as compensation for reduced applicable value of local infrastructure objects”.
The Slovenian Decree from 2003 specifies the annual amount of 4,317,000 EUR as the so-called basis for calculating compensations for any particular nuclear facility in the country. The amount applies to the year 2004 and should subsequently increase with inflation.

The amounts of CLC for a particular nuclear facility, to be paid by the manager of the facility, are specified as a percentage of the basis.
Compensations to local communities (CLC)

- The main feature of the 2008 amendments is that they have about doubled the previous amount of compensations for LILW and SF repositories.
### Types of community benefits connected with nuclear facilities in municipality of Krško

<table>
<thead>
<tr>
<th>Type of benefit</th>
<th>Amount</th>
</tr>
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<tbody>
<tr>
<td>1. LILW Repository - Compensation for local community (Krško site was selected in December 2009)</td>
<td>5,2 mln €/year</td>
</tr>
<tr>
<td>2. LILW repository - Negotiated “protocols” between local community and the Government that will finance investments in local infrastructure</td>
<td>6 mln € total amount</td>
</tr>
<tr>
<td>3. Compensation for NPP Krško – limited land use – paying now</td>
<td>5,1 mln €/year</td>
</tr>
<tr>
<td>4. HLW Repository – site hasn’t selected yet</td>
<td>5,7 mln €/year</td>
</tr>
</tbody>
</table>
Individual compensation – the newest Krško example

♦ Yearly 500 EUR to each citizen in circle of 1,5 km around reactor
Thank you for your attention!