



DEVELOPMENT OF THE FUEL CYCLE AT DUKOVANY NPP

NERS 2015 - 8th Annual Conference on Nuclear Energy
November 11, 2015

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From 3 to 6 Year Fuel Cycle



Original design - three-year cycle

- out-in-in loading scheme in 12-month interval between refuelling outages
- average enrichment 3.6 %U235
- average number of fresh assemblies per year - 116

NPP Dukovany as well as other VVER operators switched their units step-by-step to a four year cycle

First step - 3.5-year cycle

- assemblies after 3 years of operation on the edge of the core
- average number of fresh assemblies per year - 100

Next steps

- in-in-in-out loading scheme
- improvement of the neutron balance in the core
- low leakage loading patterns
- assembly shroud thickness was decreased from 2.1 to 1.6 mm
- the zirconium spacer grids were introduced instead of iron ones

From 3 to 6 Year Fuel Cycle



Four-year cycle

- assemblies with radial profiled enrichment 3.82 %U235
- average number of fresh assemblies per year - 87

Five-year cycle

- assemblies after 4 years of operation on the edge of the core
- from 2003 - assemblies with burnable absorbers (Gd) 4.38 %U235
- increased mass of uranium in assembly - enrichment 4.25 %U235
- power uprate up to 105 % - enrichment 4.38 %U235
- average number of fresh assemblies per year - 72

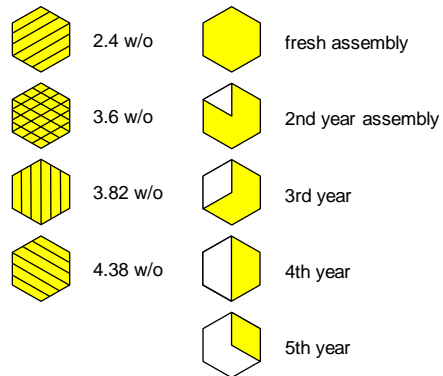
Six-year cycle

- new design of fuel rod, fuel pellet 7.8 without central hole
- new fuel assemblies mean with enrichment 4.76 %U235
- average number of fresh assemblies per year - 63

Loading Patterns

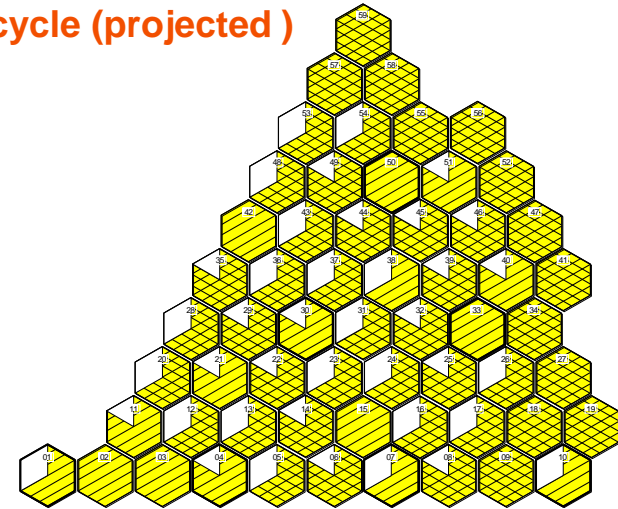


Legend



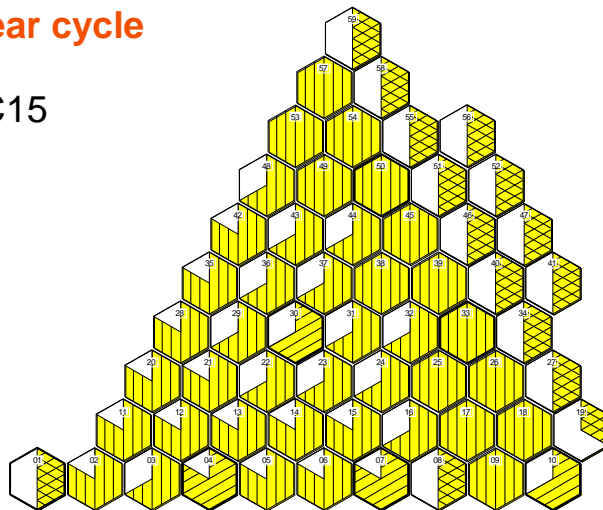
3 year cycle (projected)

B2C03



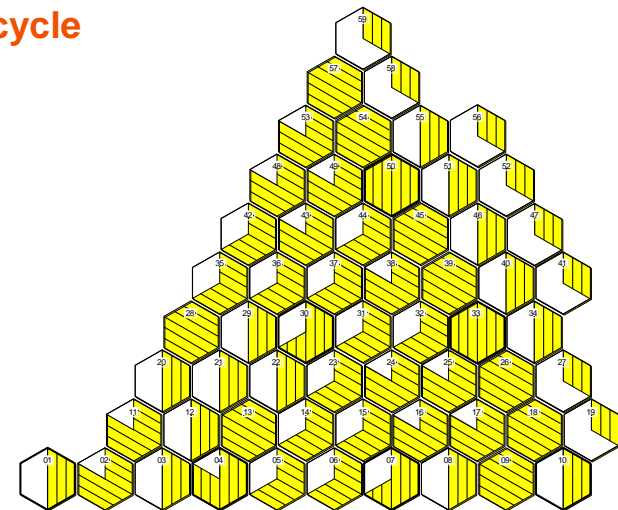
4 year cycle

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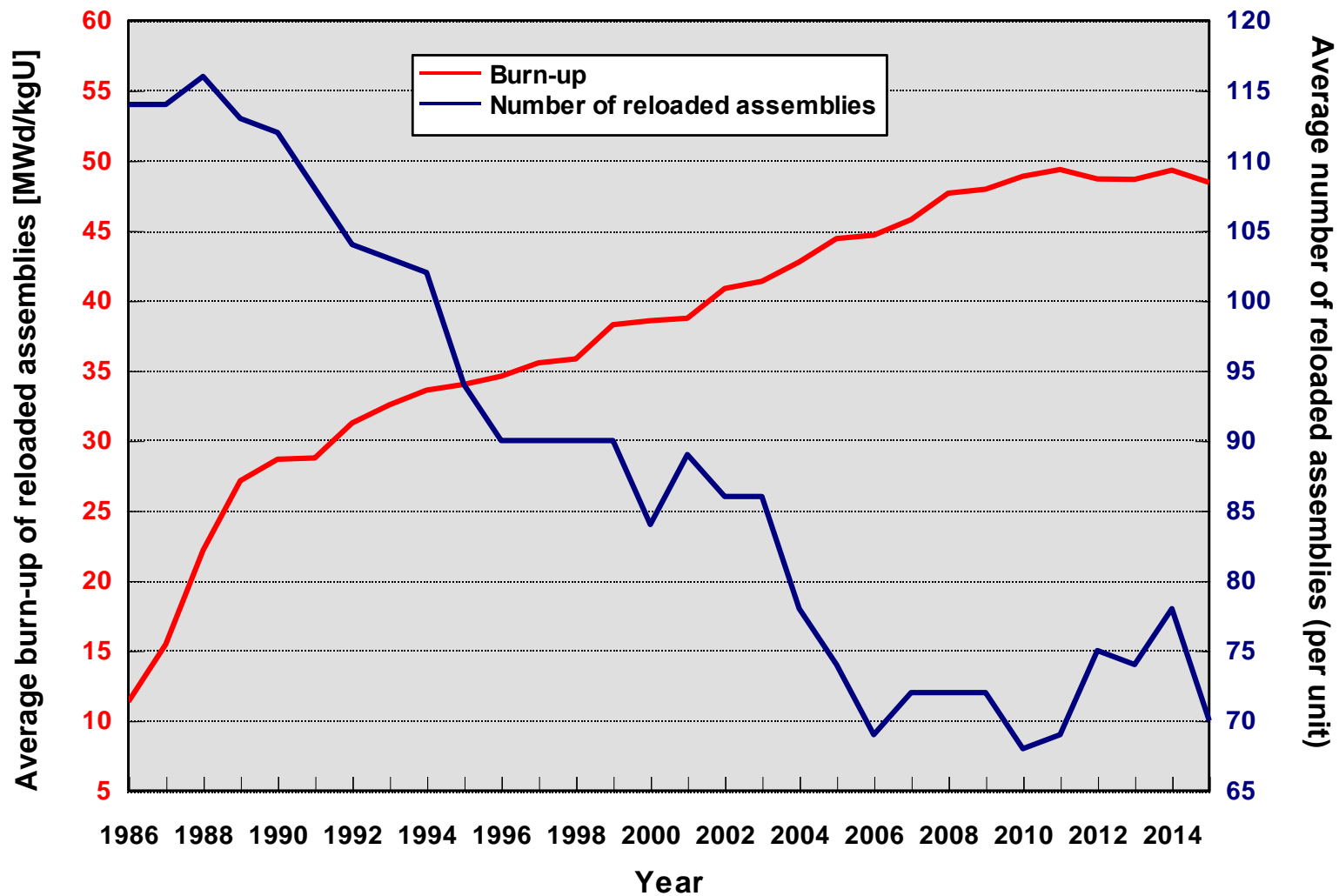


5 year cycle

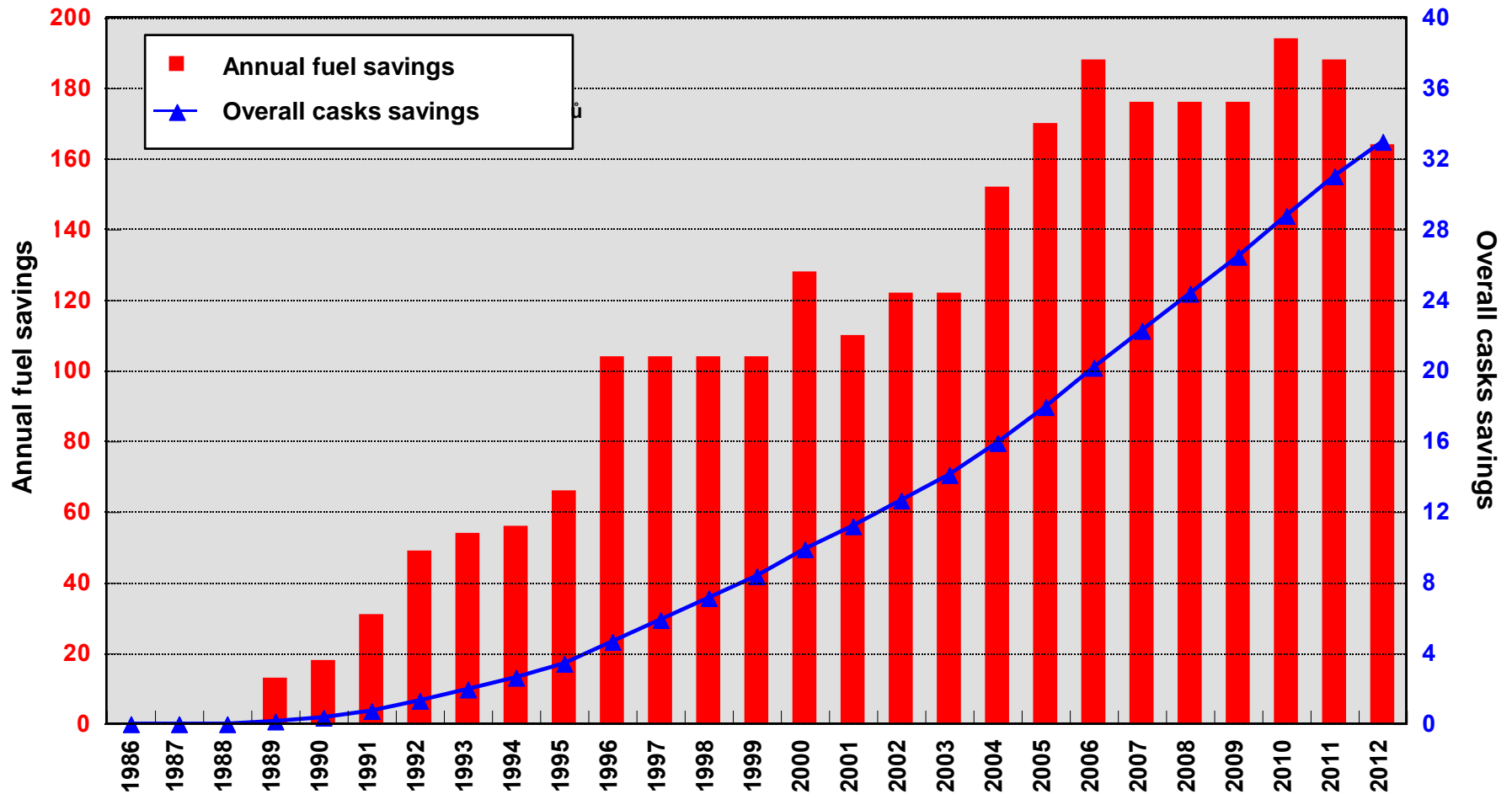
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Number of Reloaded Fuel Assemblies and Fuel Burn-up



Fuel and Casks Savings



Economic Aspect of Fuel Cycle Development

