



Finnish KELPO Project for Commercial-Grade Dedication

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KELPO background

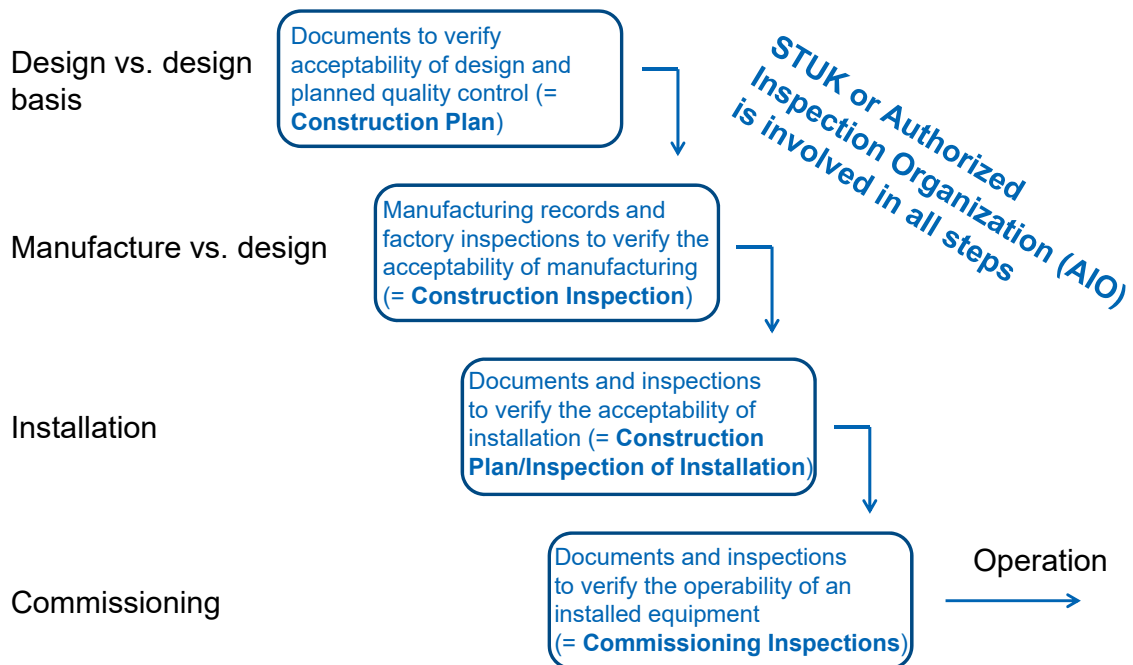
- Grounds for the KELPO joint project of Finnish operators
 - Licensing procedures for NPP equipment are found too heavy and time-consuming
 - Number of suppliers and suppliers' interest in deliveries to the NPP applications are going down
 - Original replacement equipment and spare parts are not available anymore
 - Quality development in other industrial branches is not fully considered
- Target to use standard (commercial grade) equipment for safety classified installations, and to boost cooperation between licensees regarding harmonized equipment licensing procedures
- STUK's role as an observer and commentator

fortum

TVO

FENNO
VOIMA

Present approval procedure for mech. equipment



KELPO approval procedure for mech. equipment

- Conformity assessment will be based on European 2014/68/EU PED (Pressure Equipment Directive)
- Notified Body (NoBo) is designated as a third party for the task of conformity assessment
 - EU Member States are notified by a national notifying authority*) of NoBos to carry out the task
- Design, manufacturing and inspection/testing shall comply with applicable harmonized EN standards (non-nuclear)
- KELPO to be piloted for safety classified valves (**valve pilot**) with the following alternative PED conformity assessment modules
 - Module H (Conformity based on full quality assurance)
 - Module B (EU Type examination) + Module D (Conformity to type based on quality assurance of the production process)
 - Module B + Module F (Conformity to type based on pressure equipment verification)

*) Ministry of Economic Affairs and Employment in Finland

Examples of applicable EN standards for valves

- Industrial valves. Requirements and testing for metallic valves as pressure accessories (EN 16668:2016 + A1:2018)
- Industrial valves — Shell design strength — Part 1: Tabulation method for steel valve shells (EN 12516-1:2014) — Part 2: Calculation method for steel valve shells (EN 12516-2:2014) — Part 3: Experimental method (EN 12516-3:2002)
- Specification and qualification of welding procedures for metallic materials. Welding procedure specification. Part 1: Arc welding (EN 15609-1:2019)
- Qualification testing of welders — Fusion welding — Part 1: Steels (EN 9606-1:2017)
- Non-destructive testing — Qualification and certification of NDT personnel (EN 9712:2012)
- Industrial valves — Testing of metallic valves — Part 1: Pressure tests, test procedures and acceptance criteria (EN 12266-1:2012)
- Safety devices for protection against excessive pressure — Part 1: Safety valves (EN 4126-1:2013)

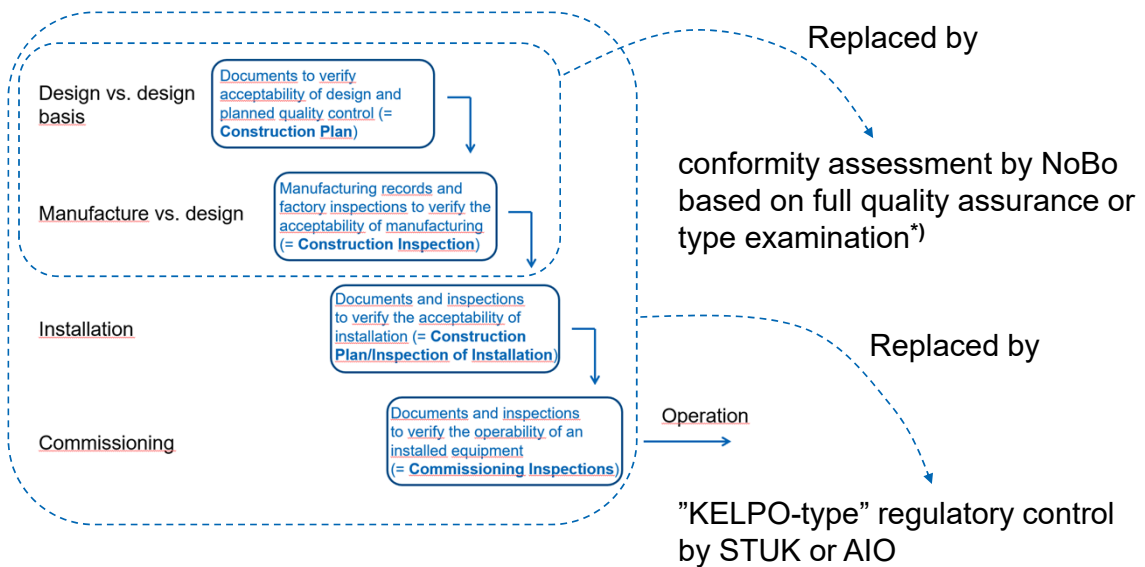
Conformity assessment modules (valve pilot) 1/2

- **MODULE H *Conformity based on full quality assurance***
 - NoBo certifies manufacturer's quality system
 - NoBo makes sure that the manufacturer duly fulfils the obligations of the approved quality system
- **MODULE B *EU Type examination – production or design type***
 - NoBo reviews the technical design and verifies the conformity
 - Optional type examinations with or without supporting evidence of a specimen (production and design types, respectively)
 - NoBo assesses construction materials if not in conformity with harmonized standards
 - NoBo approves procedures for permanent joining
 - The EU type certificate (issued by NoBo) contains all relevant information to allow the conformity of manufactured equipment with the examined type or design to be evaluated

Conformity assessment modules (valve pilot) 2/2

- **MODULE D *Conformity to type based on quality assurance of the production process***
 - Manufacturer declares the conformity with the type in the EU-type examination certificate
 - NoBo certifies manufacturer's quality system which is to ensure the compliance with the EU type
 - NoBo makes sure that the manufacturer duly fulfils the obligations of the approved quality system
- **MODULE F *Conformity to type based on pressure equipment verification***
 - Manufacturer declares the conformity with the type in the EU-type examination certificate
 - NoBo carries out the appropriate inspections and tests which are to ensure the compliance with the EU type
 - All items are individually examined

KELPO approval procedure (valve pilot)



*) Note: When applying modules H and B (design type) + D, NoBo is not involved in any assessment on the individual equipment delivered to NPP

Commercial Grade Dedication (valve pilot)

- Verifications of the manufacturer's quality processes to provide assurance that a commercial grade equipment^{*)} meets the purchaser's requirements
 - Verification of the manufacturer's quality processes
 - Audit and follow-up audits performed by the purchaser
 - PED modules H and B+D
 - Verification of the design
 - PED modules B+D and B+F
 - Verification of the manufacturing
 - PED module B+F
- Optional inspections, tests or analyses after delivery to supplement the verifications above

^{)} Commercial grade equipment refers to an equipment which has not been designed particularly based on the customer's specification but it is procured from an existing product line of the manufacturer. Typically one is manufactured in large quantities, and can be used for other applications, too. Functionality, structure, dimensions, materials, manufacturing process and quality of the component do not essentially differ within and between production lots*

Scope of regulatory control (valve pilot)

- Document review
 - Manufacturer's quality system certificate and delivery references
 - Main drawings with material data
 - Data sheet (to assess design basis vs. process system requirements)
 - Declaration of conformity issued by the manufacturer (as a proof of the compliance with the design basis)
 - Proof of the quality control when manufactured (records such as material certificates of main parts, NDT and pressure test reports, ...)
 - Additional proof (calculations, tests, NDT) may be needed if the design basis includes any special features, e.g., seismic conditions or any other doubts about conformity, e.g., CFSI
- Visual quality inspections
- Installation and commissioning inspections acc. to licensee's procedures
- Document review and quality inspections to be completed (approved) by STUK or AIO prior to installation, at the latest

Planned actions within the KELPO

- Valve procurement using the new KELPO approach (valve pilot) for the TVO OL1- and OL2-units (first installations outage 2020)
 - Shutdown reactor cooling system valves 16 pcs, safety classified DN200/250 with design parameters 300°C and 100 bar
- Collection of feed back from the valve pilot → further development of "streamlined" approval procedures for NPP equipment
- Other KELPO activities under way
 - Electrical KELPO-pilot for a battery procurement
 - I&C KELPO-pilot for a pressure transmitter
- Common general equipment specifications in Finland (partially to replace regulatory guides)
- Common approval of manufacturers and testing organizations in Finland (instead present-day licensee-specific approvals)