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## PREINSPECTION OF STEEL STRUCTURES

## General

The manufacture of steel structures that specially affect the safety of nuclear power plants must not be commenced until the Institute of Radiation Physics (IRP) has on the basis of a preinspection come to a decision in regard to it. Associated with SFL-guide 1.00.73 requirements for documents needed in the preinspection are presented here. The preinspection is carried out by the IRP.

## Scope

This guide has been made for steel structures which specially affect the safety of nuclear power plants and which SFL-guides 2.00.73 and 9.00.73 are not applied for, but which have been classified as belonging to the IRP surveillance. Such are e.g. some pressurefree containers, active sewers, steel claddings, cranes, and many steel structures of auxiliary systems. Later on the term steel structure is used for all aforementioned apparatus.

## Document

For the preinspection the applicant shall provide the authorities in triplicate with the document belonging to the pertinent steel structure, and containing the information mentioned later on. Measuring units of the SI system are recommended to be used in the document. Reference literature hard to attain shall be made available to the IRP.

The document shall have a front flyleaf which shall show the compiler of the document (signature with clarifications), all persons having audited it, as well as other relevant data.

- 1 Organizational description
- 2 Design data
- 3 Material specification
- 4 Quality control programme
- 5 Dimensioning
- 6 Drawings
- 7 Any other possible document

Laws, standards,  
recommendations,  
and literature

SFS dimensioning, material and welding standards  
ANSI N45.2-1971  
PK 1574-70  
INSKO 5-72, 36-72, 25-73, 49-73, 82-73  
RIL  
StBK-N1

## Abbreviations

SFS	Finnish standard
ANSI	American National Standards Institute
ASME	The American Society of Mechanical Engineers
INSKO	The Post-graduate Education Centre of the Engineering Societies in Finland
NGS	Northern recommendation (Nordiska gruppen för stålbestämmelser)
PK	Russian standard (PK 1514-70: Guidelines for welding joints and on-weldings of energy producing apparatus of nuclear power plants)
StBK-N1	Steel structure standard (Stålbyggnadsnorm)

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## ORGANIZATIONAL DESCRIPTION

- Purpose                    The purpose of the organizational description is to give a picture of the quality control accomplishment in the organization of the manufacturer.
- Contents                The organizational description comprises the prearrangement of quality control.
- Requirements            The entire organization shall be appropriate with regard to activity, and clear-cut in responsibility sharing.
- It is important that the quality control is sufficiently independent of manufacture.
- The chief designer of the steel structure and persons responsible for manufacturing and quality control shall be denominated.

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## DESIGN DATA

- Purpose                    Design data have the purpose of clearing up the design bases of the steel structure.
- Contents                Design data shall comprise, dependent on structure
- definition of the purpose of the steel structure
  - functional description revealing the position of the structure in the system, where to it belongs
  - design bases, indicating
    - design values, as temperature, hydrostatic pressure, external loads, supports etc.
    - functional requirements, e.g. external and operational circumstances
    - standards, codes, and criteria, which form the design basis, with argumentation
  - siting drawings and descriptions
  - geometry and loading combinations of the steel structure.
- Requirements            The preinspection document shall contain sufficient description of design data. As far as the IRP already has system descriptions, it is sufficient to refer to these.

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## MATERIAL SPECIFICATION

- Purpose                    The purpose of the material specification is to give a picture about the applicability of materials (basic and welding materials) for their intended use.
- Contents                The document shall indicate the material standards of various parts and the mode of certificate.
- Requirements            The qualities of the materials shall fulfil the requirements of those standards (of the manufacturing country or the manufacturer), after which they have been cited in the catalogue. Chemical analysis shall meet the requirements set upon weldability.

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## QUALITY CONTROL PROGRAMME

## Purpose

The purpose of the quality control programme is to present inspections to be carried out for the steel structure, and inspection requirements.

When needed, a procedure test programme has to be presented, the purpose of which is to assure with the aid of test works the application of the manufacturing method to production when special structures and materials are used.

## Contents

The document contains the inspection procedure, scope, and requirement level of materials and manufacture.

The programme reveals what quality control measures various parts are going to carry out.

## Requirements

By using various inspection methods it is verified that the steel structure fulfils Finnish rules, or the quality level of nuclear power plant standards approved in Finland.

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## DIMENSIONING

- Purpose A structure mechanical derivation of the dimensions or some other sufficient argumentation for the steel structure has to be presented.
- Contents Dimensioning calculations are furnished with drawings, which indicate necessary measures and loads.
- Requirements The dimensioning is compiled in accordance with SFS standards or other directions.
- Depending on the structure and operational circumstances an additional examination concerning the stability, vibration properties, fracture, fatigue, or other qualities, has to be presented when needed.

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## DRAWINGS

## Purpose

The purpose of the drawings is to describe the structure in regard to its assembly and details such that the dimensions, shape, and manufacture of the steel structure are sufficiently shown in detail.

## Contents

The drawings shall be unambiguous and clear. They shall show

- measures and shapes used in or derived from strength calculations and stress or other analyses
- type, positioning, and measures of joints
- position of various materials in the apparatus.

## Requirements

The drawings shall fulfil the requirements of SFS or equivalent standards.