NSP/007/027 – Guidance on Substation Design: Pressure Systems and Vessels

1. Purpose

The purpose of this document is to provide guidance on design of Primary and Supply Point substations in order to comply with the requirements of the Pressure System Safety Regulations (2000) and has been prepared to satisfy the requirements of Electricity Safety Quality and Continuity Regulations (2006).

This document supersedes the following documents, all copies of which should be destroyed.

Reference	Version	Date	Title
NSP/007/027	2.0	March 2018	Guidance on Substation Design: Pressure Systems and Vessels

2. Scope

This document applies to the design of all Primary and Supply Point substations constructed on the Northern Powergrid network. There are additional duties that fall to the construction engineer, owner and operator associated with pressure systems.

2.1. Table of Contents

3. Pressure Systems

3.1. Policy

The design of all Primary and Supply Point substations constructed on the Northern Powergrid network. There are additional duties that fall to the construction engineer, owner and operator associated with pressure systems.

3.2. General

No pressure system shall be designed or modified other than by an approved contractor or consultant. Any pressure system where a gas or liquefied-gas is pressurised above 0.5 bar gauge may fall within the Pressure System Safety Regulations (2000) (PSSR (2000)). These regulations apply to fixed and mobile systems.

3.3. SF6 Compartments Forming Part of Switchgear

Pressurised SF6 compartments forming part of electrical switchgear are exempt from the PSSR (2000).

3.3.1. Gas Filled Cables

Gas filled cable systems are exempt from the PSSR (2000).

3.3.2. Fixed Fire Extinguishing Systems

Fixed fire extinguishing systems must comply with PSSR (2000).

3.3.3. Trolley Mounted SF6 Handling Plants

Trolley mounted SF6 handling plants must comply with PSSR (2000).

3.4. Application of Pressure System Safety Regulations (2000) PSSR (2000)

3.4.1. Assessment of Pressure Systems

PSSR (2000) imposes duties upon the designer, owner and operator of the pressure system dependent upon the size and pressure of the system. It is therefore important that any system be assessed at the project design stage as described I HSC ACOP L122 and the result recorded in the designer's risk assessment.

3.4.2. Pressure-Volume Product below 250 Bar Litre

Where the pressure-volume product of the system is less than 250 bar litre, sufficient information must be obtained and forwarded to the owner/operator to allow safe operation, maintenance and inspection of the system.

3.4.3. Pressure-Volume Product above 250 Bar Litre

Where the pressure/volume product of the system exceeds 250 bar litre, sufficient information must be obtained and forwarded to the owner/operator to allow safe operation, maintenance and inspection of the system. In addition a written scheme of examination shall be produced by a nominated competent person as defined in PSSR (2000). The written scheme of inspection must be provided to the substation owner/operator and the scheme of inspection commenced before the system is commissioned.

With regard to Primary and Supply Point substation design, the competent person will be the supplier or modifier of the system. The substation owner/operator shall have responsibility for implementing and recording the scheme of examination.

4. References

4.1. External Documentation

Reference	Title
PSSR (2000)	Pressure System Safety regulations (2000)
ESQCR (2006)	Electricity Safety Quality and Continuity Regulations (2006)
N/A	Health and Safety Commission (HSC) ACOP L122

4.2. Internal Documentation

Reference	Title
HAS/028	Pressure Systems
SAF/PRES/01	Northern Powergrid Register of Occupational H&S Requirements
SAF/001/424	Guidance on Pressure Systems and Transportable Gas Containers

4.3. Amendments from Previous Version

Reference	Description
N/A	Format updated to new CDS template

5. Definitions

Reference	Definition
N/A	N/A

6. Authority for Issue

6.1. CDS Assurance

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

		Date
Liz Beat	Governance Administrator	05/02/2024

6.2. Author

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

Review Period - This document should be reviewed within the following time period.

Standard CDS review of 3 years	Non Standard Review Period & Reason	
Yes	Period: n/a	Reason: n/a
Should this document be displayed on the Northern Powergrid external website?		Yes
		Date
Mark Thompson	Major Projects Specification & Design Engineer	30/05/2024

6.3. Technical Assurance

I sign to confirm that I am satisfied with all aspects of the content and preparation of this document and submit it for approval and authorisation.

		Date
Steve Duck	Major Projects Operations Manager	13/06/2024

6.4. Authorisation

Authorisation is granted for publication of this document.

		Date
Dave Sillito	Head of Major Projects	24/05/2024