



The Importance of Timing Categorisation and Classification Activities in the Design Sequence of a New Build Project

J. Krzyzosiak

Introduction

- Who I am
 - **Jonathan Krzyzosiak**
- Experience
 - **Physics Degree and Nuclear Masters**
 - **Equipment Reliability – Torness**
 - **EDF Energy – Generation & NNB**
 - **HPC Responsible Designer**

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What is Categorisation and Classification?

What is Categorisation and Classification?

Key Ideas

The safety of the plant is dependent on the performance of SSCs during normal, hazard and fault conditions

The effect on nuclear safety of a failure of a SSC depends on its significance and its role

Purpose

Help ensure the plant is designed, manufactured, constructed, commissioned and operated so that SSCs have the appropriate level of integrity and reliability

Process

The systematic assessment of the importance to nuclear safety of each component and its allocation to a safety class on the basis of this safety significance

Results

The safety class allocated to a component defines the design, testing and maintenance measures to be applied in its design, construction, commissioning, and operation

What is Categorisation and Classification?

Nuclear Body	Categorisation	Classification
IAEA ¹	All functions and design provisions necessary to achieve the main safety functions should be identified. The functions should then be categorized into a limited number of categories on the basis of their safety significance	All items important to safety shall be identified and shall be classified on the basis of their function and their safety significance
ONR SAPS ²	The safety functions should be identified and categorised based on their significance with regard to safety	Structures, systems and components that have to deliver safety functions should be identified and classified on the basis of those functions and their significance to safety

1 – SSG 30: Safety Classification of Structures, Systems and Components in Nuclear Power Plants 2014

2 – Safety Assessment Principles for Nuclear Facilities – 2014 Edition Revision 0

What is Categorisation and Classification?

Faults
Monitoring
Hazards
Duty



Main Safety Functions

- Control of Reactivity
- Heat Removal
- Confinement

Categorisation

- Identify and categorise Safety Functions based on their importance to safety

Classification

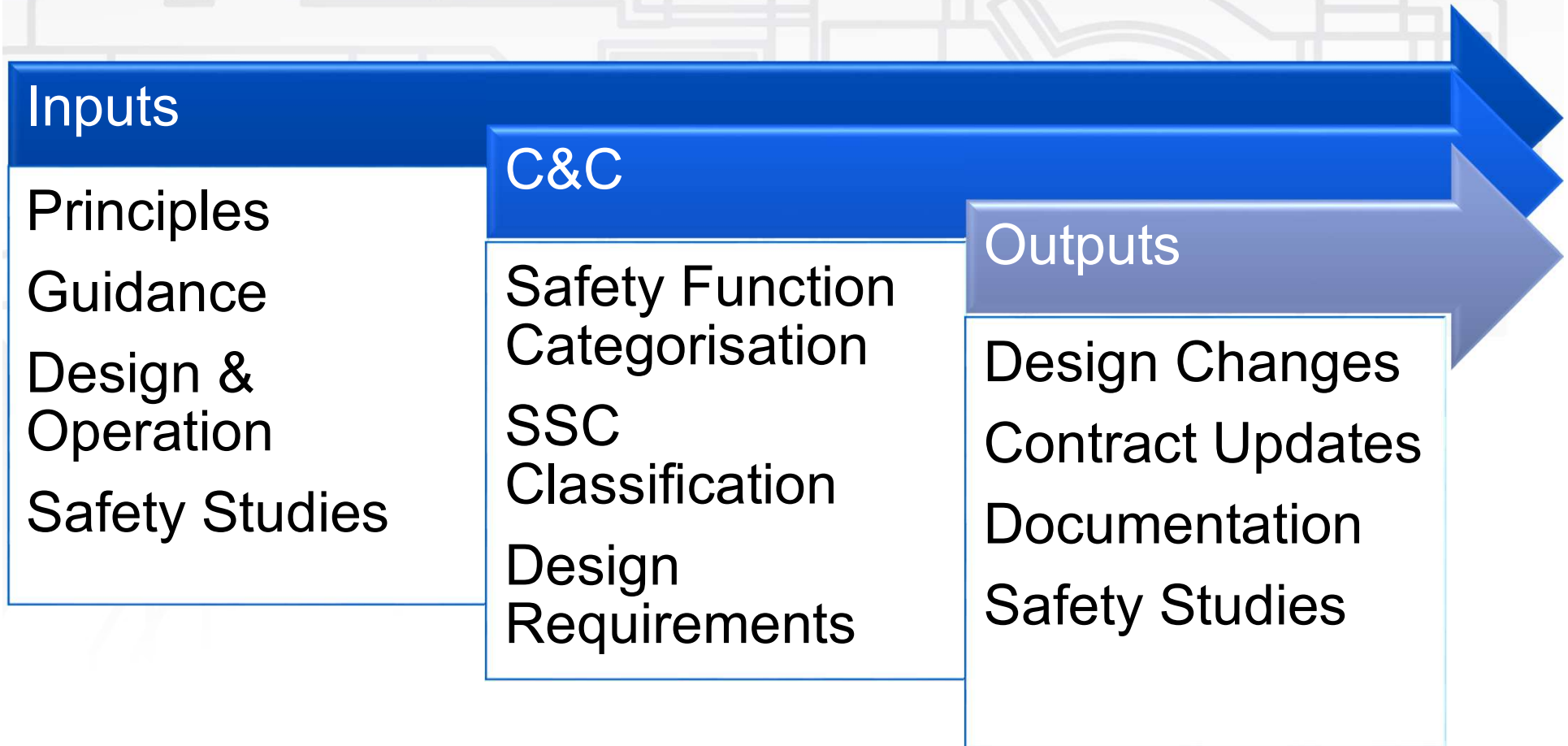
- Classify SSCs based on the importance of the Safety Functions they ensure

SSC – Structures, Systems and Components



The Inputs and Outputs of Categorisation and Classification

The Inputs and Outputs

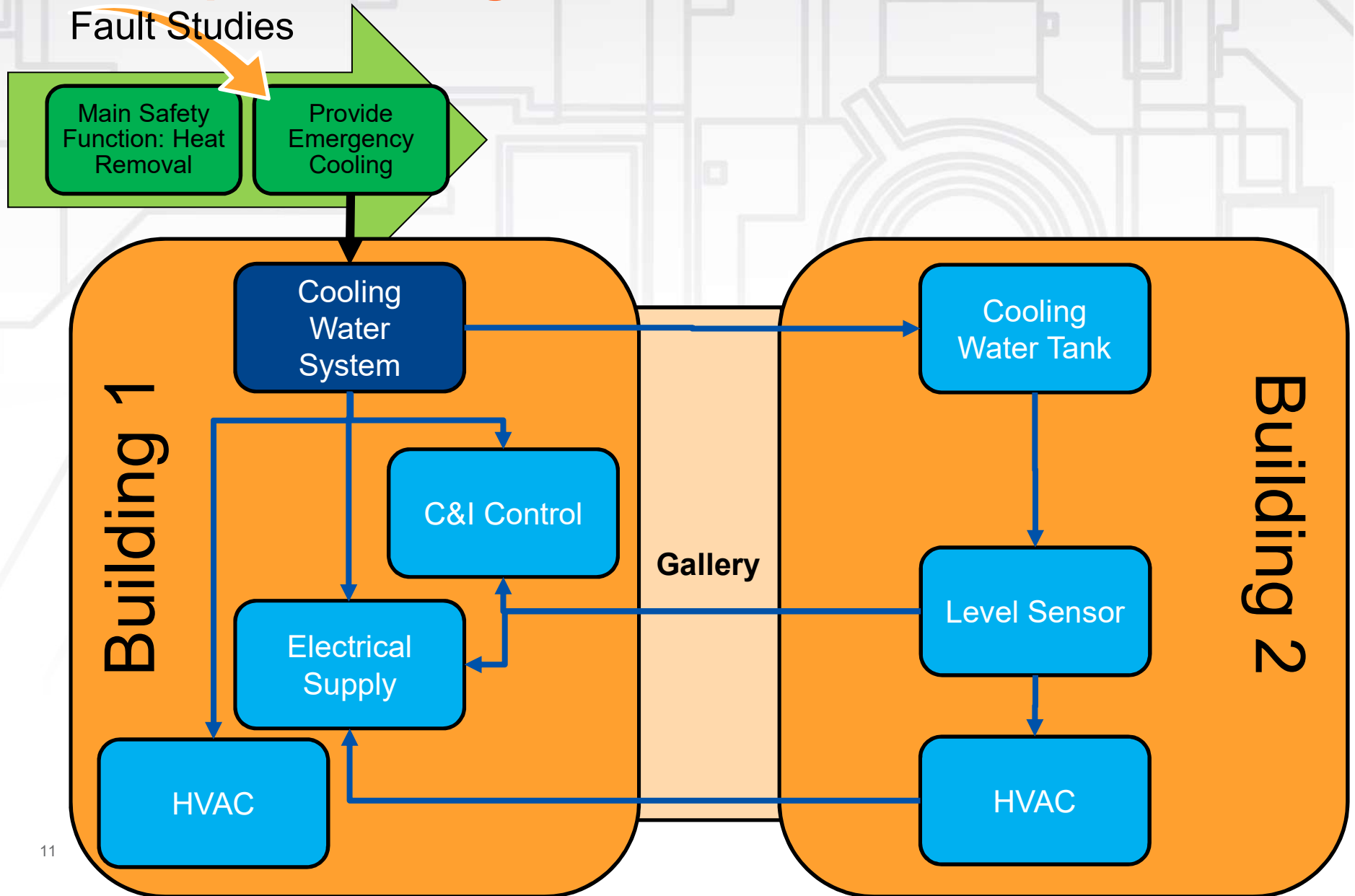


A faded technical drawing of a mechanical part, possibly a camera lens or a similar optical component. The drawing shows a complex assembly with various circular and rectangular features, including a prominent circular lens element on the right side. The lines are light gray, and the overall image is semi-transparent.

Example

Example of Categorisation and Classification

Fault Studies



A faint, light gray architectural floor plan of a building, showing various rooms, corridors, and a large circular feature, possibly a central atrium or a large room with a circular opening. The lines are thin and the overall appearance is that of a technical drawing or blueprint.

The New Build Project Constraints

The New Build Project Constraints

Long time before return on investment

Time = Money

Don't change the design once construction has commenced

Begin Construction Early

Safety Studies: Faults; Hazards; PSA; Fukushima; etc

Safety Case Development

Building Design: Accident, Hazard and Normal Loads: Seismic Qualification; GWL; etc

Reference Configuration Control

System Design, Layout and Operation in Faults, Hazards and Normal Operation

Human Based Safety Claims

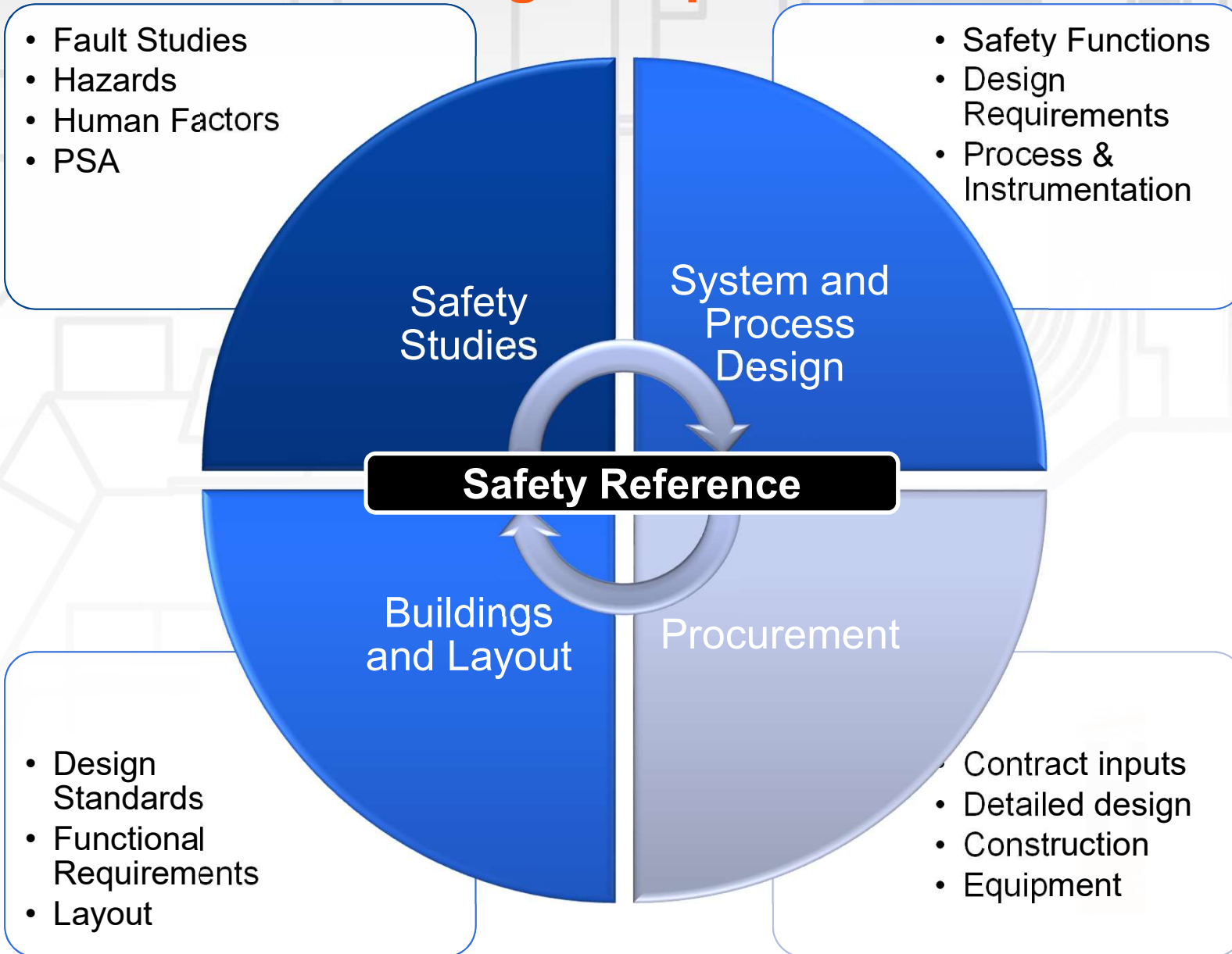
Regulator Interaction & License Conditions

Iterative Design Process

A faded, light gray technical drawing of a mechanical part, possibly a camera lens or a similar optical component, serves as the background. The drawing shows various concentric circles, rectangular shapes, and lines representing the geometry of the part. The text "The Design Sequences" is overlaid in a bold, orange font.

The Design Sequences

Links with the Design Sequences



Resulting Design Sequence

Project Processes and Communication

Scheduling

Safety Case

System and
Process Design

Buildings and
Layout

Procurement

Reference Configuration
Management

Construction

Learning Points

Project Processes

The clarity and efficiency of project processes is key to managing the impacts of Categorisation and Classification activities

Configuration Management

Control of the Reference Configuration ensures that consistent Categorisation and Classification information is used throughout the project

Scheduling

Categorisation and Classification activities need to give the right information, in the correct level of detail at the right time

Construction Order

The order of construction will impact the order of Categorisation and Classification activities

Margins and derisking

Margins and derisking activities should be incorporated into the design sequences to ensure the availability of information at the right time

Simplicity

Categorisation and Classification should be kept as simple as possible



Questions?



Thank you