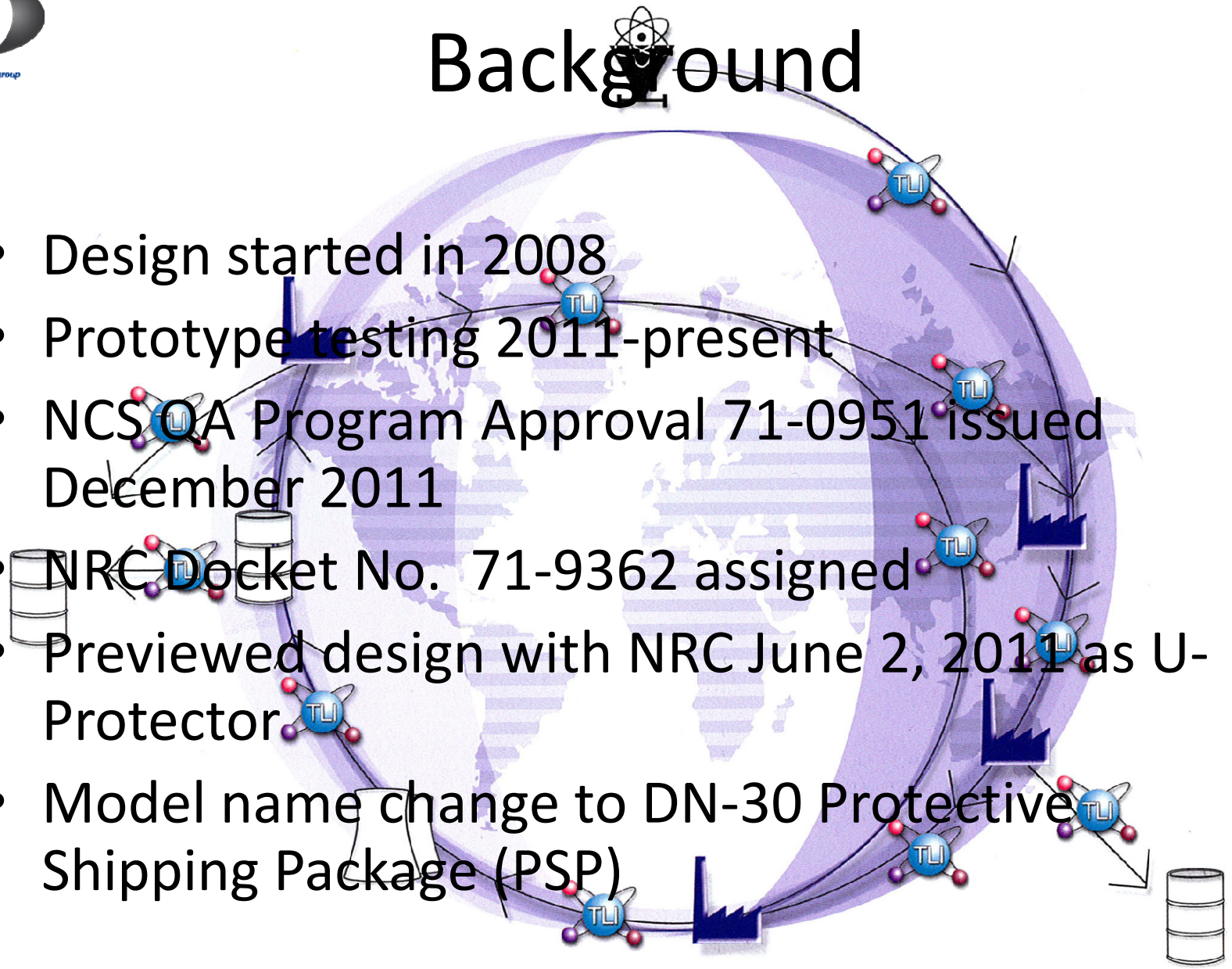
DN-30 Package Review

Transport Logistics International

NRC Meeting

June 6, 2012

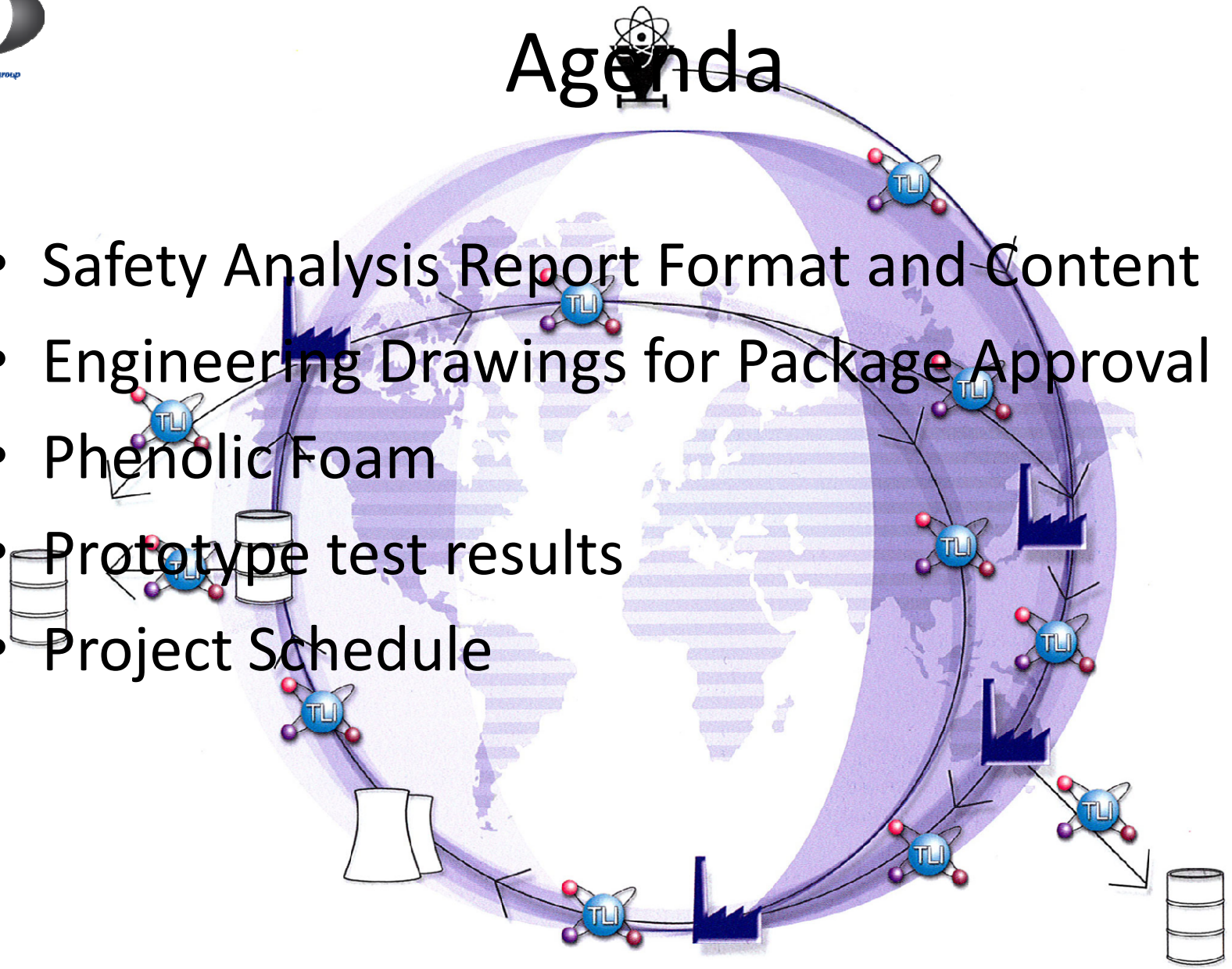
Background



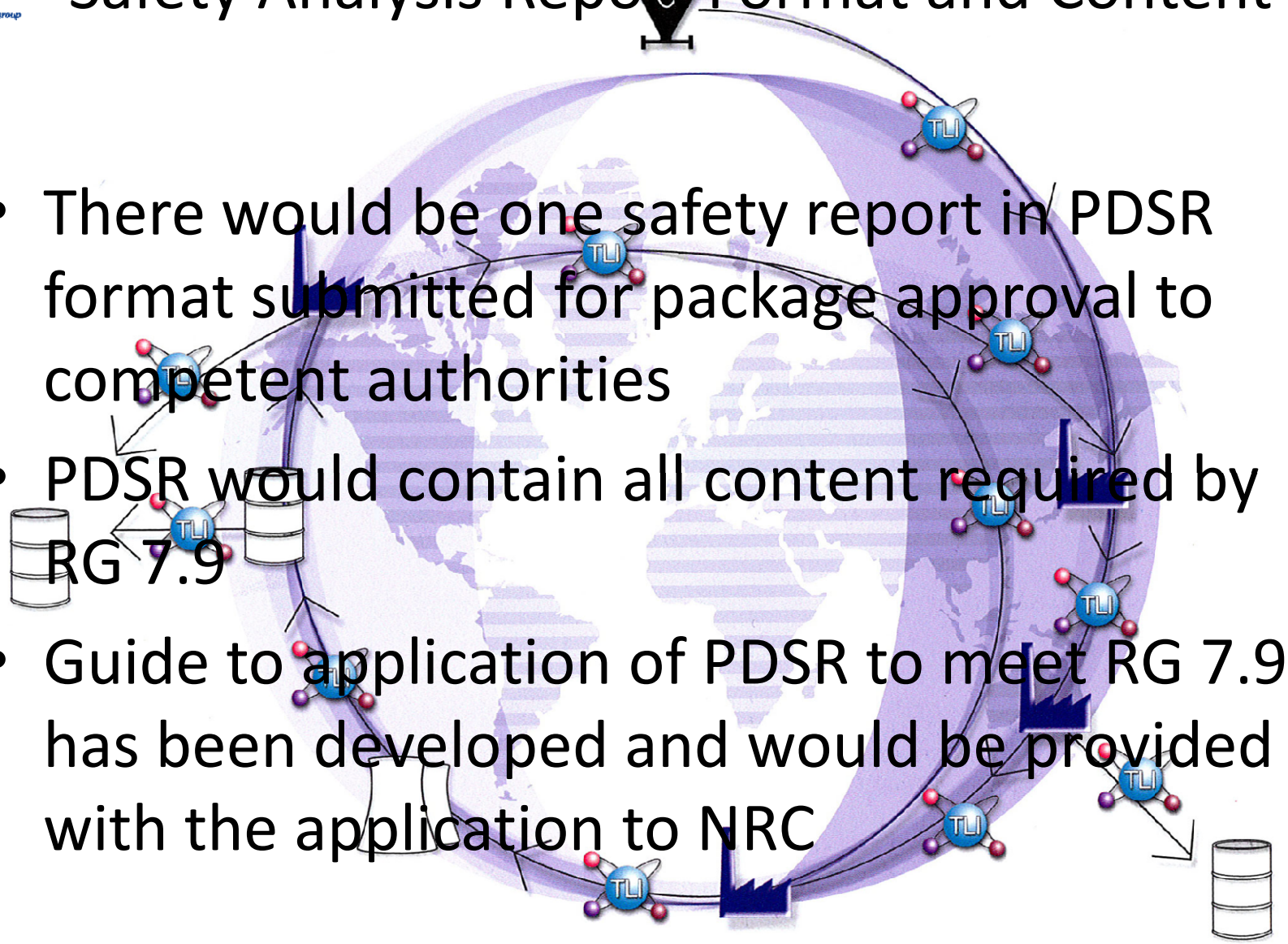
- Design started in 2008
- Prototype testing 2011-present
- NCS QA Program Approval 71-0951 issued December 2011
- NRC Docket No. 71-9362 assigned
- Previewed design with NRC June 2, 2011 as U-Protector
- Model name change to DN-30 Protective Shipping Package (PSP)

Agenda

- Safety Analysis Report Format and Content
- Engineering Drawings for Package Approval
- Phenolic Foam
- Prototype test results
- Project Schedule

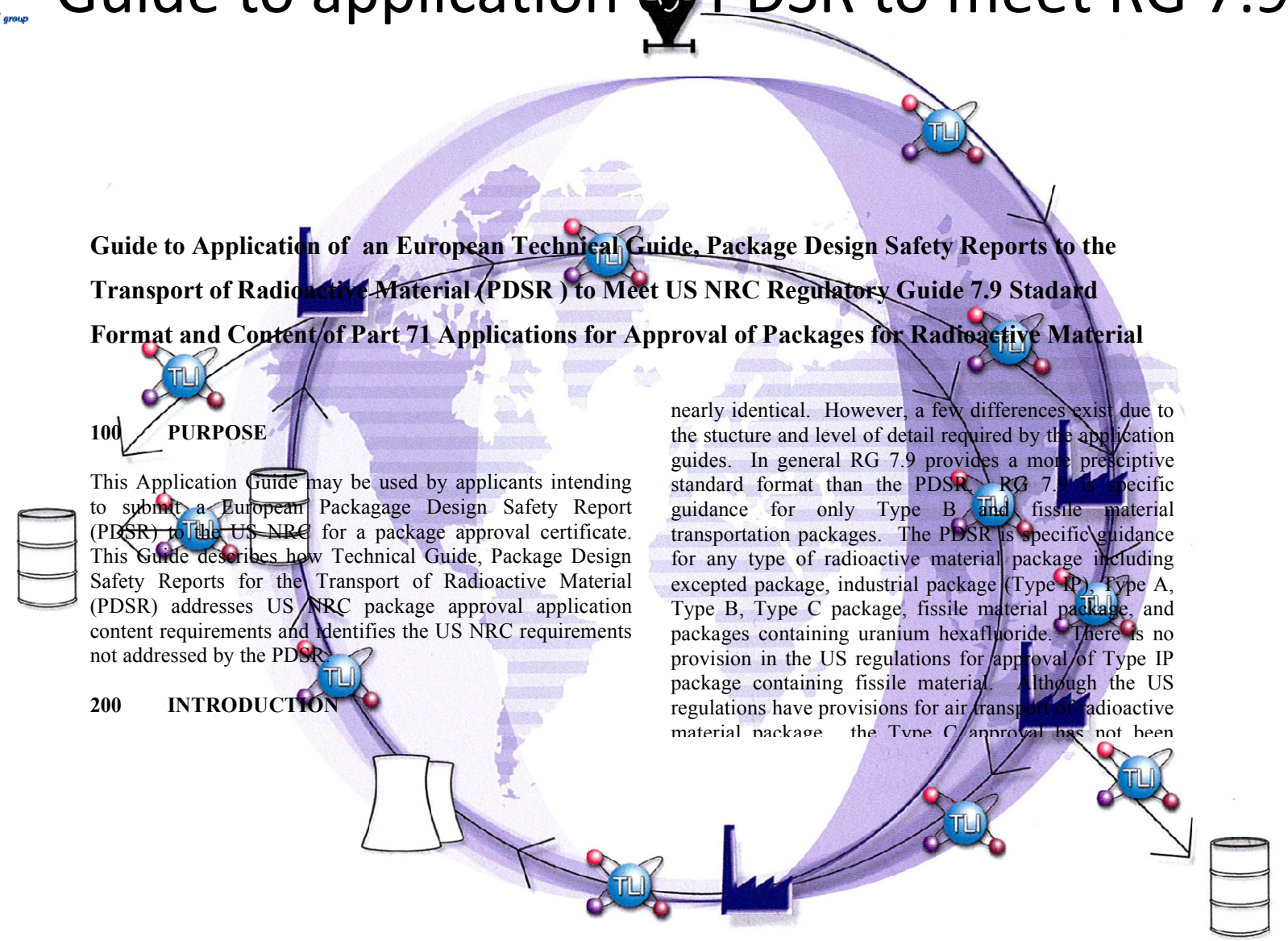


Safety Analysis Report Format and Content



- There would be one safety report in PDSR format submitted for package approval to competent authorities
- PDSR would contain all content required by RG 7.9
- Guide to application of PDSR to meet RG 7.9 has been developed and would be provided with the application to NRC

Guide to application PDSR to meet RG 7.9



Guide to Application of an European Technical Guide, Package Design Safety Reports to the Transport of Radioactive Material (PDSR) to Meet US NRC Regulatory Guide 7.9 Stadard Format and Content of Part 71 Applications for Approval of Packages for Radioactive Material

100 PURPOSE

This Application Guide may be used by applicants intending to submit a European Packagage Design Safety Report (PDSR) to the US NRC for a package approval certificate. This Guide describes how Technical Guide, Package Design Safety Reports for the Transport of Radioactive Material (PDSR) addresses US NRC package approval application content requirements and identifies the US NRC requirements not addressed by the PDSR.

200 INTRODUCTION

nearly identical. However, a few differences exist due to the stucture and level of detail required by the application guides. In general RG 7.9 provides a more presciptive standard format than the PDSR. RG 7.9 is specific guidance for only Type B and fissile material transportation packages. The PDSR is specific guidance for any type of radioactive material package including excepted package, industrial package (Type IP), Type A, Type B, Type C package, fissile material package, and packages containing uranium hexafluoride. There is no provision in the US regulations for approval of Type IP package containing fissile material. Although the US regulations have provisions for air transport of radioactive material package, the Type C approval has not been

Corresponding RG 7.9 to PDSR

Table 300-1 Corresponding RG 7.9 (Section 1) to PDSR Sections

RG 7.9, Section 1 – General Information	PDSR
1. GENERAL INFORMATION This section of the application should present an introduction and a general description of the package.	**1 PACKAGE DESIGN SAFETY REPORT: PART 1** Part 1 of the PDSR should include the following information:
1.1 Introduction This section should identify the proposed use of the package, the model number, and, in the case of fissile packages, the proposed criticality safety index (CSI).	**1.2 Administrative information** (a) Colloquial name of package, if applicable (b) Identification of package designer (name, address, contact details) (c) Type of package design (d) Packaging / package design identification and restrictions in packaging serial number(s) (if applicable) (e) Modes of transport for which the package is designed (including any restrictions) (f) Reference to applicable regulations, including the edition of the IAEA Regulations for the Safe Transport of Radioactive Material to which the package design is referring. **Annex 3, Part 1, 1.2** To be complied with (e) compliance with additional requirements for air transport (see Table 1) should be considered **Annex 4, Part 1, 1.2** To be complied with

PDSR Example

1.2. Administrative information

(a) Name of package:
DN30

(b) Identification of package designer:
DAHER CSI
23, route de Tours - BP 30017 - 41400 St Julien de Chédon - FRANCE

(c) Type of package design:

Type B(U)F package, containing fissile material, and containing more than 0.1 kg of uranium hexaflouride.

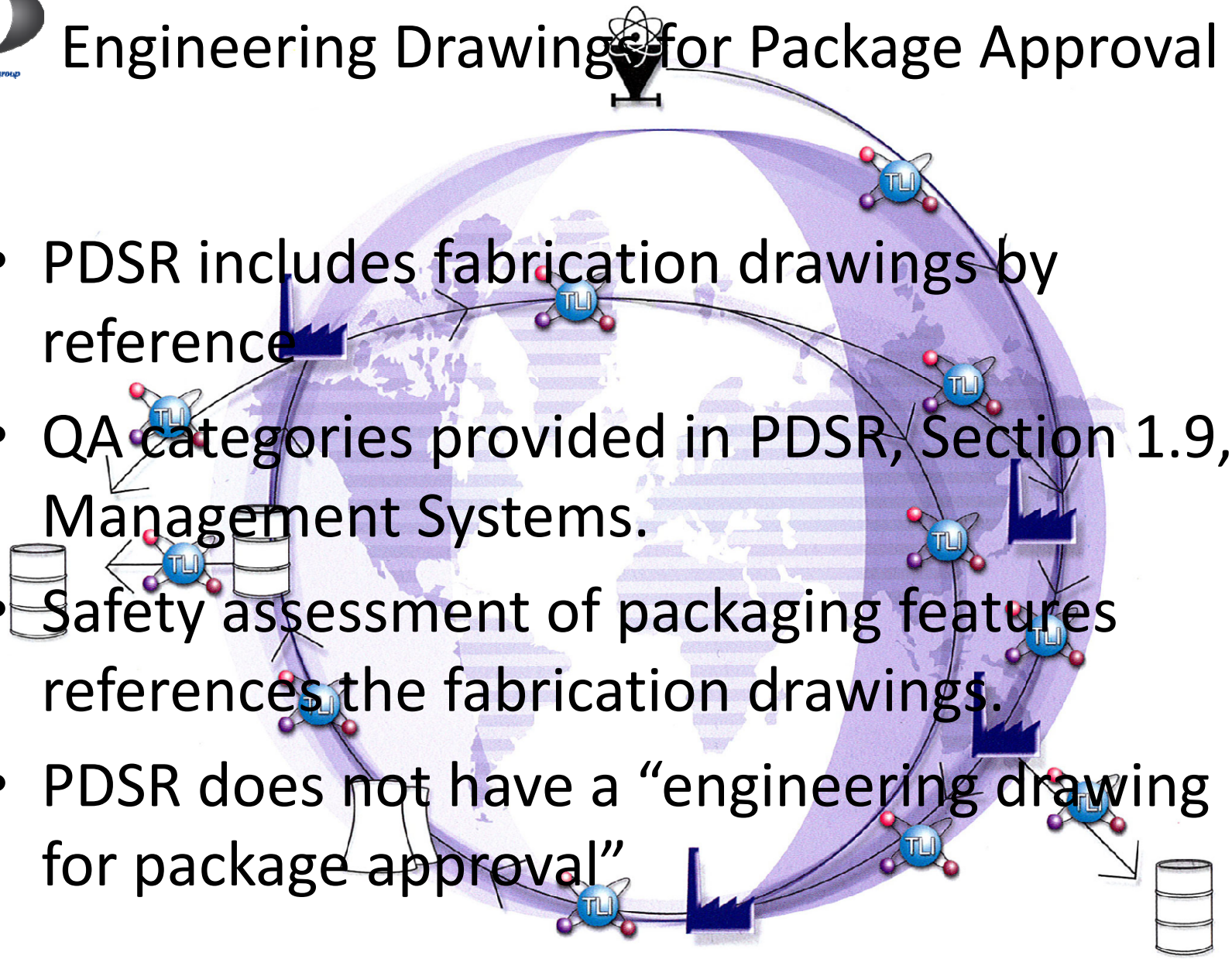
In the case of uranium hexaflouride with activities not exceeding A_2 quantities the **AF** type code may apply.

In the case of uranium hexaflouride classified as LSA-II material the **IF** type code may apply as allowed by national regulations.

In the case of non-fissile or fissile excepted uranium hexaflouride the **H(U)** type code shall apply.

A criticality safety index (*CSI*) equal to zero shall be assigned to packages containing fissile uranium hexaflouride.

Engineering Drawings for Package Approval

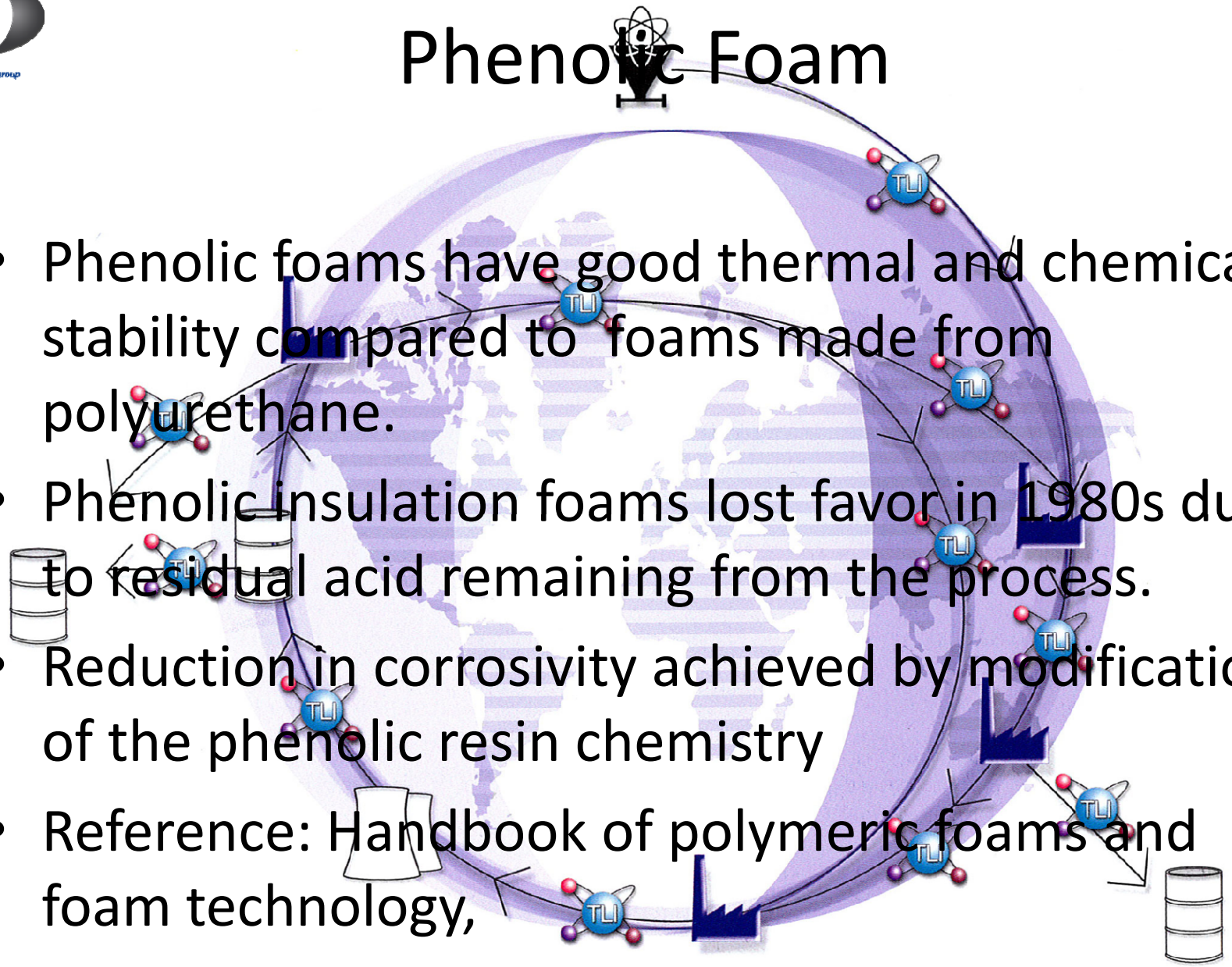


- PDSR includes fabrication drawings by reference
- QA categories provided in PDSR, Section 1.9, Management Systems.
- Safety assessment of packaging features references the fabrication drawings.
- PDSR does not have a “engineering drawing for package approval”

Safety Assessment of Packaging Features

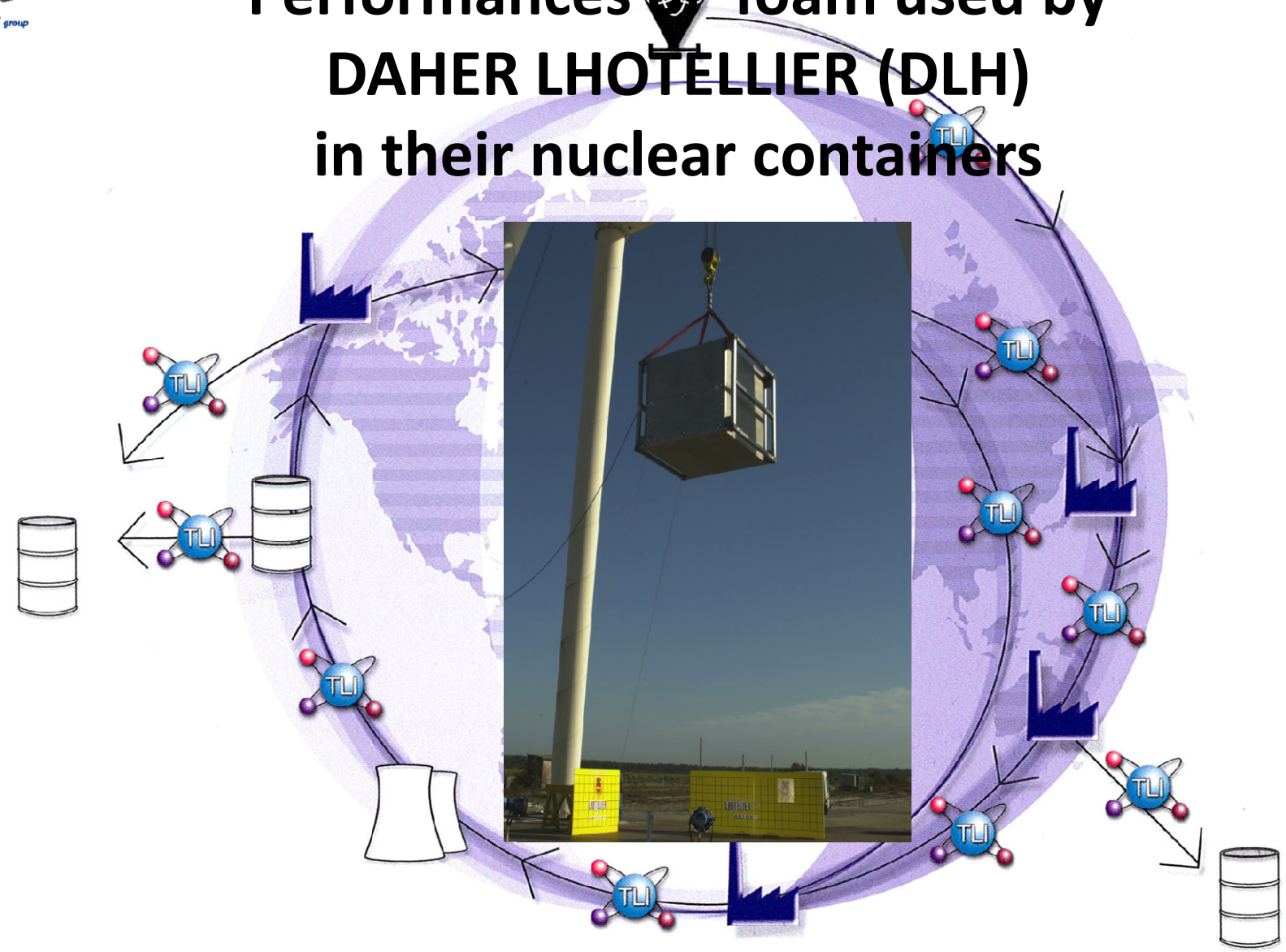
Feature	Q Category	Function	Component Name	Drawing Number	Part Number	Item Number
IMPACT DES LIMITOR – COQUE HAUTE *IMPACT LIMITOR – TOP HALF*	A	Structural integrity Heat transfer	COQUE HAUTE *TOP HALF*	LDN00079002	-	02
IMPACT DES LIMITOR – COQUE HAUTE *IMPACT LIMITOR – TOP HALF*	A	Structural integrity	COQUE HAUTE SOUDURE *TOP HALF WELDS*	1DN00079102	-	-
COQUE HAUTE *TOP HALF*	B	Structural integrity	COQUE BASSE-FOND EXT	1DN00079101	-01	01
			FOND AR INTER *BOTTOM AR INTER*	1DN00079102	-03	03
			FOND AV INTER	1DN00079102	-04	04
			ENV EXTER	1DN00079102	-05	05
			ENV INTER	1DN00079102	-06	06
			RENF EXTER 1	1DN00079102	-07	07
			RENF EXTER 5	1DN00079101	-22	08
			PIED DE POSE *FOOT OF INSTALLATION*	1DN00079102	-12	09
			PDJ LONGI 1	1DN00079102	-14	10
			COQUE HAUTE-PDJ LONGI 2	1DN00079102	-15	11
			COQUE HAUTE-PDJ TRANSV 1	1DN00079102	-16	12
			COQUE HAUTE-PDJ TRANSV 2	1DN00079102	-17	13
			COQUE HAUTE-PDJ PROTEC 1	1DN00079102	-18	14
			COQUE HAUTE-PDJ PROTEC 2	1DN00079102	-19	15

Phenolic Foam



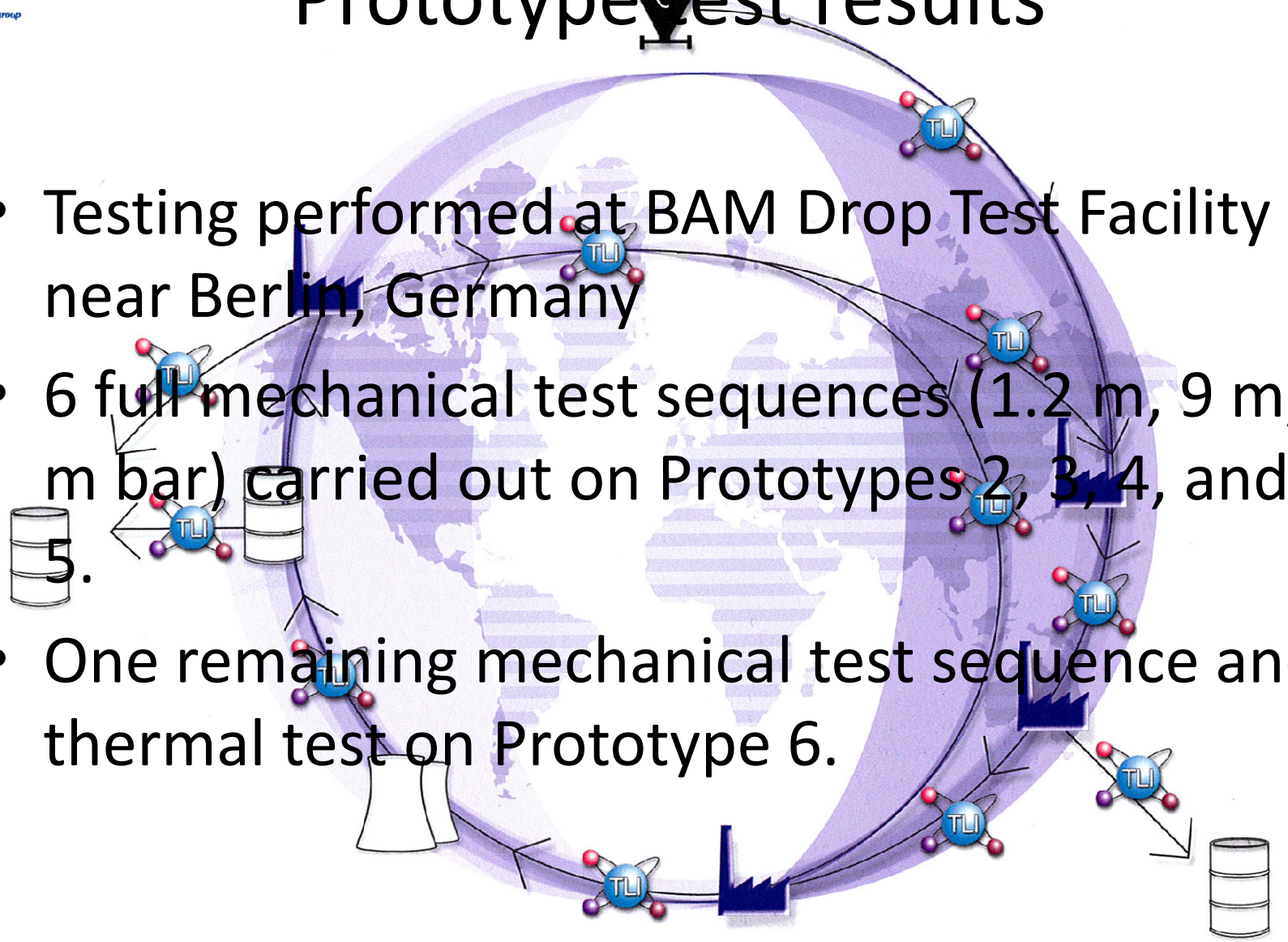
- Phenolic foams have good thermal and chemical stability compared to foams made from polyurethane.
- Phenolic insulation foams lost favor in 1980s due to residual acid remaining from the process.
- Reduction in corrosivity achieved by modification of the phenolic resin chemistry
- Reference: Handbook of polymeric foams and foam technology,

Performances of foam used by DAHER LHOTELLIER (DLH) in their nuclear containers



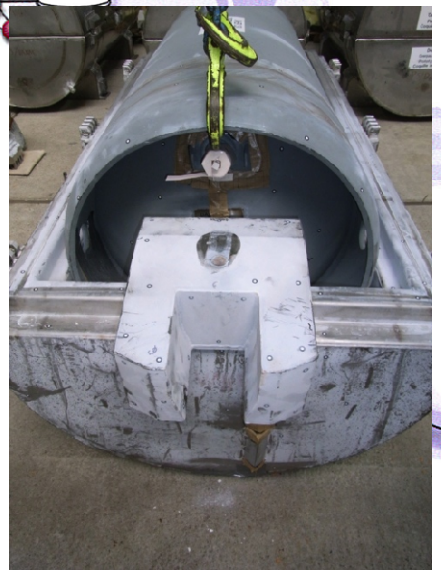
Prototype test results

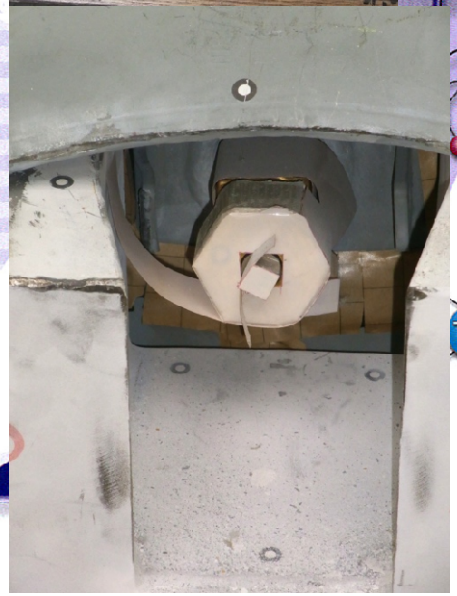
- Testing performed at BAM Drop Test Facility near Berlin, Germany
- 6 full mechanical test sequences (1.2 m, 9 m, 1 m bar) carried out on Prototypes 2, 3, 4, and 5.
- One remaining mechanical test sequence and thermal test on Prototype 6.



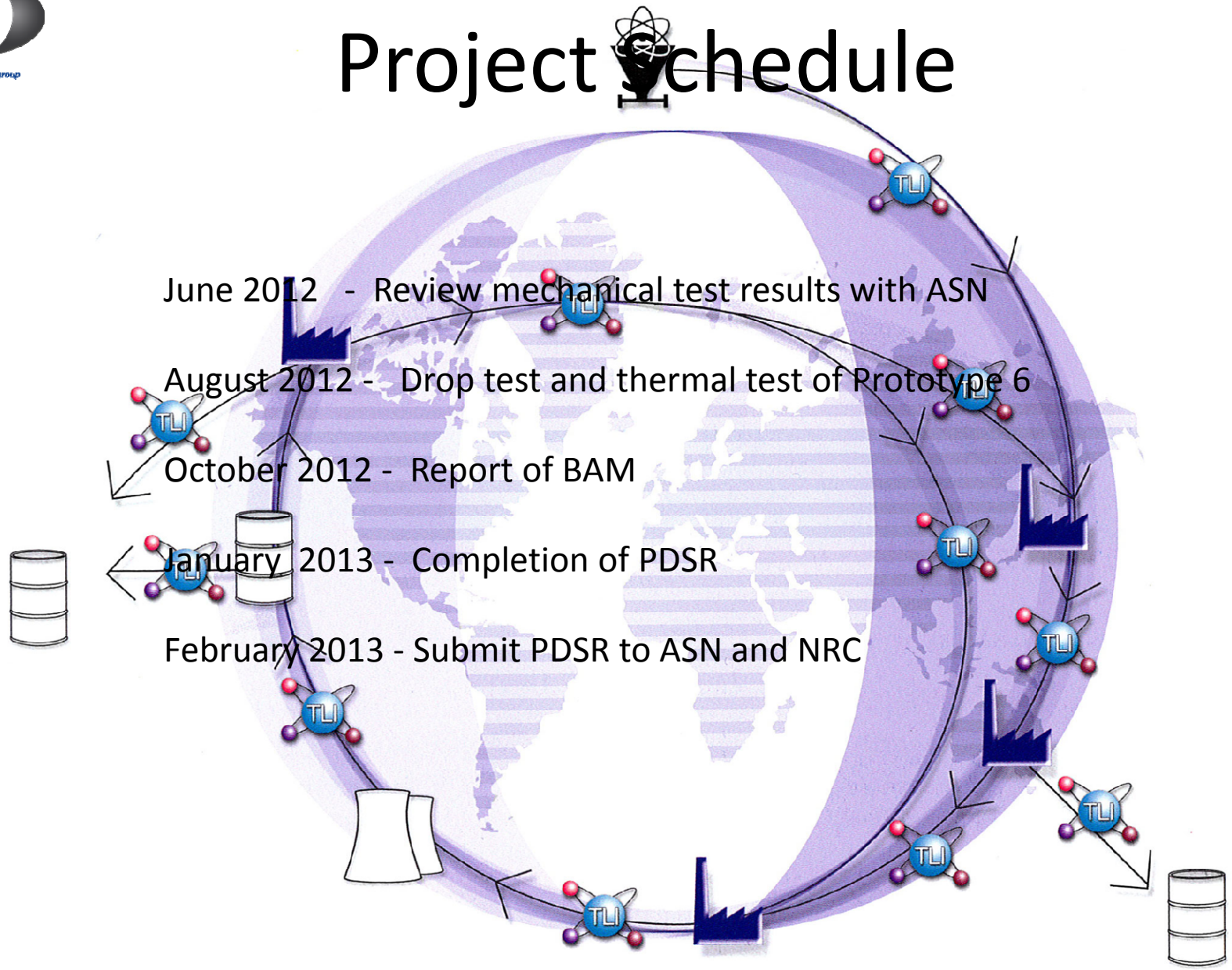
Prototype test sequence

Closure flange and valve protection





Project Schedule



June 2012 - Review mechanical test results with ASN

August 2012 - Drop test and thermal test of Prototype 6

October 2012 - Report of BAM

January 2013 - Completion of PDSR

February 2013 - Submit PDSR to ASN and NRC