

# Compliance Office (CO)

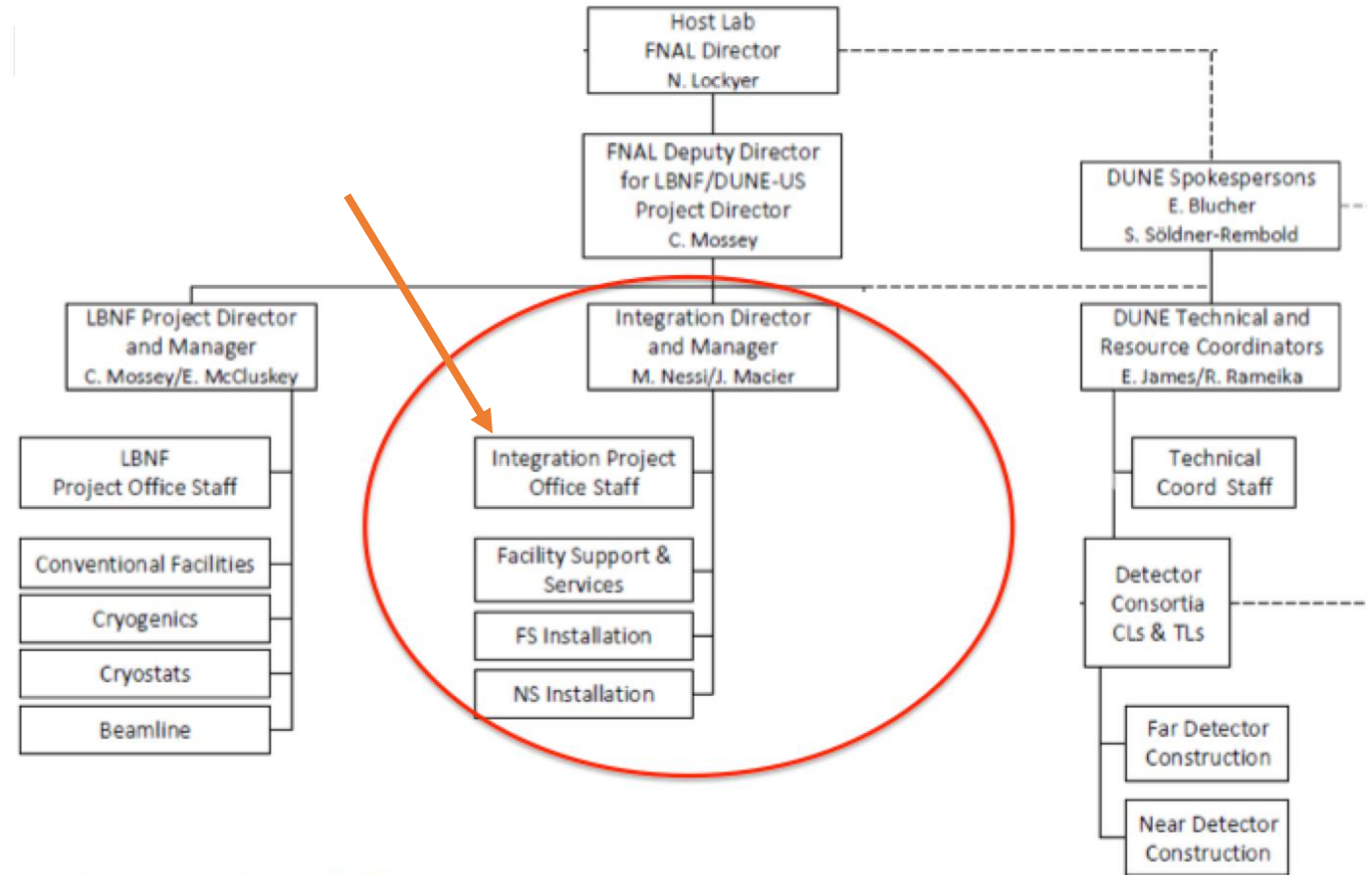
## Mandate and guidelines

O. Beltramello – 01.02.2020

# The mandate

The Compliance Office is part of the  
**Integration Project Office**

## Organization



The Compliance Office **defines, leads and implements** the process of assessment, validation and sign-off for the equipment **compliance to mechanical and the electrical standards and regulations.**

# What do we deal with ?

- Any equipment associated with the LBNF/DUNE project to be installed in service or experimental caverns at SURF or at Fermilab, from design, to fabrication, installation, commissioning and operation.
- Only equipment with major safety implications are assessed. Equipment will be classified after screening by the CO.
- Equipment can be commercial or custom.
- Any tool, lifting device, or structure used to transport or manipulate equipment that will end in the near or far site must be assessed.

## We do NOT take care of:

- Equipment that are part of civil construction
- Tools developed in the Institutes to construct their detector
- Equipment at construction factory
- Equipment related to the Neutrino Beam Line

But we are open to discussions, case by case ...

# We act in 3 main complementary domains :

## 1. Applicable Rules and Regulations for the Project and US / EU standards equivalencies

Due to the international nature and the complexity of the LBNF / DUNE, we need to define what are the **applicable rules and regulations** for our Project.

This is done in collaboration with FNAL and SURF responsible parties.

This covers all life-time of the equipment including design, fabrication, transport, installation, commissioning and operation.

**Our non-negotiable goal: we must be compliant with the US and DOE regulations.**

The CO is defining the applicable the standards and assisting the sub-projects to interpret them when required.

The CO determines the list of required equivalency checks between the US and the EU standards ... and we do perform these equivalency analyses.

We do have equivalencies already performed by Fermilab defined and agreed with DOE:

US AISC and European EN 1993, EN 1990, EN 1991, EN 1999 and EN 14620.



## Acceptance of Steel and Aluminum Structures Designed per the Eurocodes at Fermilab

R. Alber, B. Rubik, A. Vasonis

Ad Hoc Alternative SBN / LBNF / DUNE Structural Codes and Standards Review Panel

July 18, 2017

**Abstract:** This paper provides evidence that structures designed per EN 1990, EN 1991, EN 1993, EN 1999 (a subset of the "Eurocodes"), and EN 14620 have a generally equivalent level of safety to structures designed per the analogous US codes. Based on this evidence, the paper recommends accepting structures designed per these standards for use at Fermilab or Fermilab-operated space contingent on a review of the design documents for these structures.

EN 13155

versus

ASME BTH-1

Directive machine 2006/42/CE

ASME B30.20

... and they are not fully equivalent.

The US standard covers the EU one for the design aspects.


We have decided to use the US standard for the APA lifting frame (See Giuseppe's talk) but we increase the load factor up to the level of Machine Directive (1.5 instead of 1.25 for ASME)

  
Russ Alber, Facilities Engineering Services Section

7/18/17  
Date

  
Brian Rubik, Facilities Engineering Services Section

7/18/17  
Date

  
Arv Vasonis, Facilities Engineering Services Section

7/18/17  
Date

## 2. Equipment mechanical compliance checks and validation

A team of several engineers is being set up to perform these checks and take responsibility to validate the compliance of equipment.

Mechanical team: O. Beltramello, G. Gallo, J-L. Grenard, M. Zimbru



Electrical team : T. Shaw and engineers to be clarified ...

**We are working closely with the project engineers to :**

- clarify what is required from regulations and standards
- help them to propose an analysis plan and to provide the required documentation all along the project

We have issued **a set of mechanical guidelines** tailored for the LBNF/DUNE project in order to help the engineers to present the compliance of their equipment and request approval of the CO in a coherent and efficient way.

Released

  <i>Long Baseline Neutrino Facility, DUNE &amp; CERN Neutrino Platform</i>	<a href="https://edms.cern.ch/document/2172998/1">https://edms.cern.ch/document/2172998/1</a>		
Document EDMS identifier: <a href="#">2172998</a>	Fermilab LBNF DocDB:	Created: 21-Jun-19	
		Last Modified: 11-Dec-19	Rev. No.: <b>1.0</b>

**Validation of the LBNF/DUNE structures and structural components for equipment and detectors**

Abstract:

This technical note describes the information to be presented in the structural engineering file to obtain the validation of the DUNE/LBNF structures and structural-components for equipment and detectors that will be installed inside DUNE.

This note provides also the list of applicable European and US standards and guidelines that shall be applied from the structural design through the fabrication, assembly, installation and commissioning process.

<i>Prepared by:</i>  <b>M. Andreini</b> CERN <b>O. Beltramello</b> CERN <b>G. Gallo</b> FERMILAB <b>A. Rigamonti</b> CERN <b>T. Shaw</b> FERMILAB	<i>Checked by:</i>  <b>J. Fowler</b> DUKE <b>J. Macier</b> FERMILAB <b>M. Andrews</b> FERMILAB	<i>To be approved by:</i>  <b>E. James</b> FERMILAB <b>M. Nessi</b> CERN
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The document defines the CO requirements and especially what must contain the engineering file and in which format :

- The technical 2D drawings and geometrical 3D models
- The transportation, the installation and the operation technical specifications
- Standards and regulations for design, fabrication, testing, operation.

Mandatory to authorize  
the equipment  
production

Some classification of equipment are being agreed with the project management.

For example: the execution class as required by EN1090 (defines the severity of the controls on fabrication), type of lift (critical lifts or not) for lifting devices, ..

- Operational (or serviceability requirements) ... **This is today not clear enough – Urgent**

**These requirements that are not required by standards (safety) but are derived from the project needs (max. deformations, positioning for physics). They need to be approved by the management.**

**These requirement might be more stringent than the ones from standards and can be the sizing case**

**It is mandatory to clarify them at the beginning of the design phases (urgent for the APA lifting frame for example) ...**

- The structural design calculation notes
  - mass budget (dry/wet, contingencies) and materials (from standards or provider or tests)
  - load cases and combinations **(with justifications !!)**
  - type of mechanical analyses (FEA, analytical) , required verifications (stresses, connections, buckling, linear/ non-linear , etc. ..)

- **The required QA/QC documentation (that will be channeled to the CO by the DUNE QA/QC responsible).**

To prove compliance with the Standards ..

This could be factory production control by the manufacturer, including inspections and testing of products sampled, materials certificates, batch numbers and origin, procedure to manage the changes and non-conformity, declaration of conformity, strength conformity, welding procedures, welders certificates, welds examination results, testing results, etc....

- **The eventual testing documentation on structures and structural components of the equipment.**

Test justification and strategy, the test procedure and results ..

- The final in situ equipment inspections before commissioning or operation

This will be performed and documented by the Compliance Office Engineer in charge

Mandatory to authorize the equipment installation

Mandatory to authorize the equipment commissioning or operation

**The engineering file will contain all the documentation related to the acceptance or recommendations from the CO and the LBNF/DUNE ES&H manager.**

**The engineering file will expand during the life-time of the equipment and should always be kept up to date by the technical leaders of the consortium.**

## How do we interact with the Review Office

The CO validation process summary documentation and conclusions will be provided as an input to the Project Review Office.

The mechanical and electrical recommendations issued from the Reviews committees will be included in the engineering file and followed up by the CO.

## How do we interact with the ES&H manager

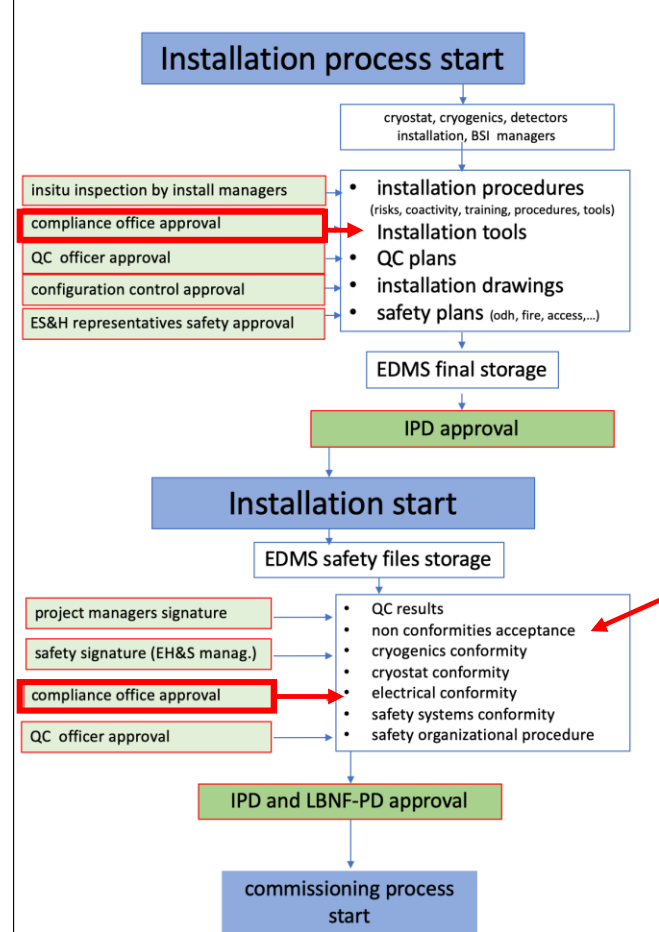
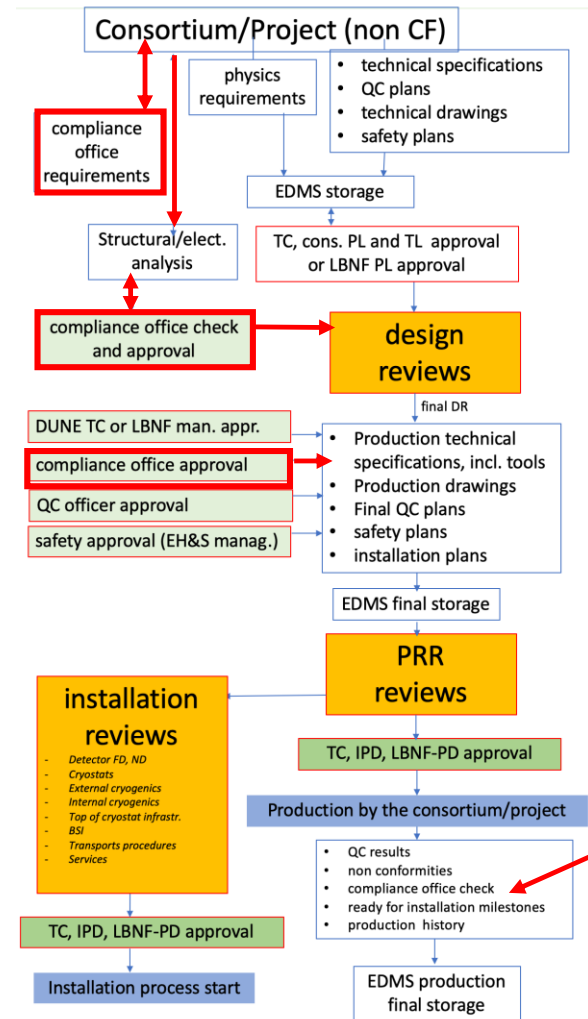
The Compliance Office will keep inform the ES&H manager of the process of structural compliance checks and of the status of the engineering file.

Any variance or derogation will be submitted to the approval of the ES&H manager by the CO who will technically justify the request in collaboration with the equipment responsible.

The Compliance is part of the approval process at various stage of the project.

This is done in agreement with the main project sign-off strategy.

The CO defines what is required to get the CO approval all along the project life-time ( content, milestones and responsibilities).



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LBNF/DUNE

LBNF

DUNE

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Integration Office (i&I)

Mechanical Integration

Electrical Integration

Compliance office

Standards and Regulations

2111194 (v.1) FRP applicable norms

2302773 (v.1) European Mechanical Standards

2142687 (v.1) Structural Analysis Procedures

2309585 (v.1) European Lifting Standards and Regulation

2309591 (v.1) US Lifting Standards and Regulation

Detectors Compliance

APA

HV system

2172998 (v.1) Structural validation of the DUNE/LBNF Equipment and detectors

2093094 (v.1) Compliance Office - Mandate, Roles and Responsibilities

2173000 (v.1) Safety validation process of the LBNF/DUNE Equipment and detectors

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Schedule office

QC librarian/EDMS

Far Site Installation

2309591 v.1

In Work

Public access

Engineering Specific

US Lifting Standards and Regulation

by Olga BELTRAMELLO

Created on 2020-0

Last Modified on 2020-0

Edit   Status   Share   Visibility   More

Info

Description:

External reference:

Keywords:

Details

Local administrators: [List of Administrators](#)

Context: [CENF-LBNF-DUNE](#)

CENF-LBNF-DUNE

Equipment code:

Release procedure: [DOC-OWNER](#)

Simple document release procedure

Associated Links:

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	ASME_B30_Safety_standards.pdf	6.8 MB	2020-01-16 15:00:59	Olga BELTRAMELLO
	B30-20_2013.pdf	1.2 MB	2020-01-16 17:00:04	GIUSEPPE GALLO
	BTH-1_2017.pdf	1.6 MB	2020-01-16 17:00:04	GIUSEPPE GALLO

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More info

# Conclusion

- ❖ We are now starting quite intensively ...
- ❖ Even if we set up requirements .. , we also **actively participate to the projects** and we try to help you solving issues when any.
- ❖ We are here to help you and make sure that your equipment is safe and fulfill DOE requirements.
- ❖ We will accompany the projects all along their life-time up from design to operation.
- ❖ Don't hesitate to contact us and implicate us, this will make the process much efficient and easier.

**Tell us what you need !!!**