

Cabling activities:  
Strategy for a new project

<J-C1 Guillaume EN-EL-CF>

## Introduction

This is a description of the general strategy concerning the organisation of cabling campaign for new projects.

In the oldest accelerators structures, the cable ladders are overloaded and it is nowadays impossible to install quantities of cables for a new project.

The general strategy for the removal of the unused cables is explained too.



## Content

Part 1: Removal of the unused cables:  
strategy and work methodology

Part 2: New cabling campaign: general strategy  
- Preparation  
- General schedule for a new project,

Part 3: Booster specificities.

# Part 1: Removing the unused cables

Why ?

## On site:

- Eliminate old and unused system.
- Simplify the links between racks and control rooms.  
If necessary, remove the patch panels
- Recuperate the space in the cable ladders and in the civil engineering passages
- Eliminate as much as possible the cables containing halogen

## Documentation:

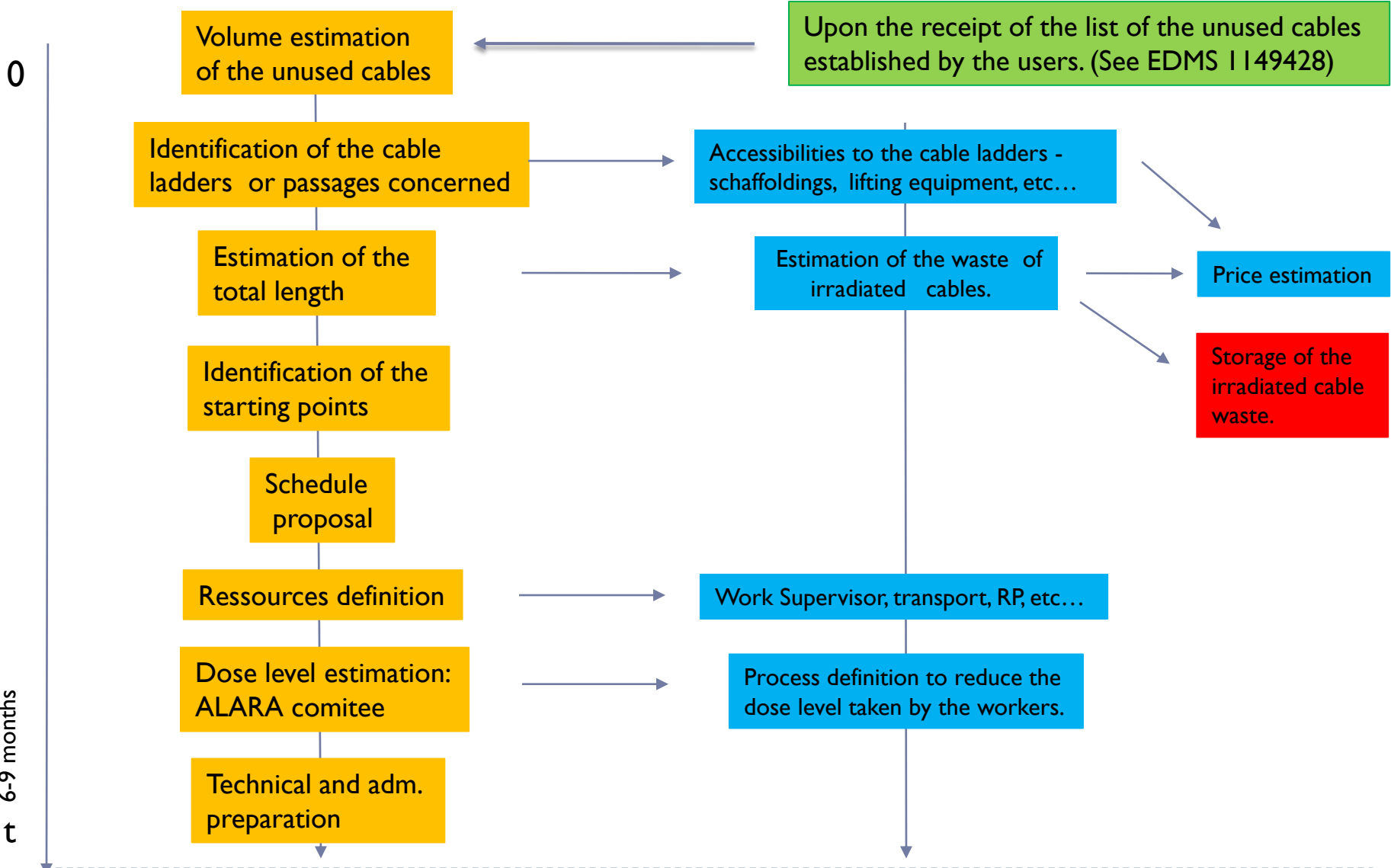
- Updating the layout of the racks and the cable Data Base (cablotheque)

## Principle:

**The more the quantity of cables to remove is important, the more this operation will be effective: cost, feasibility and planning.**

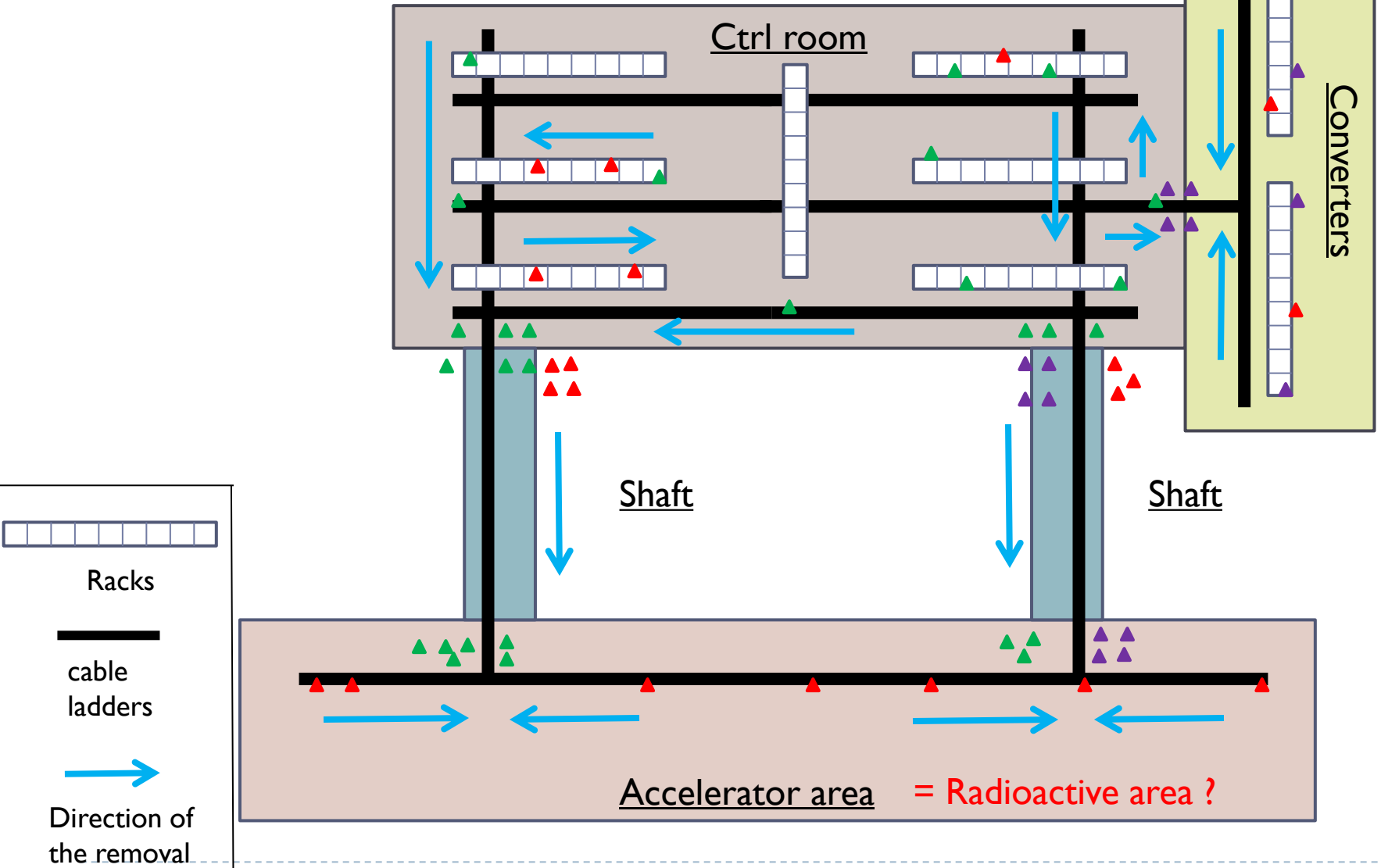
Intercom syst ?  
(354)





τ  
6-9 months

Part I: Removing the unused cables



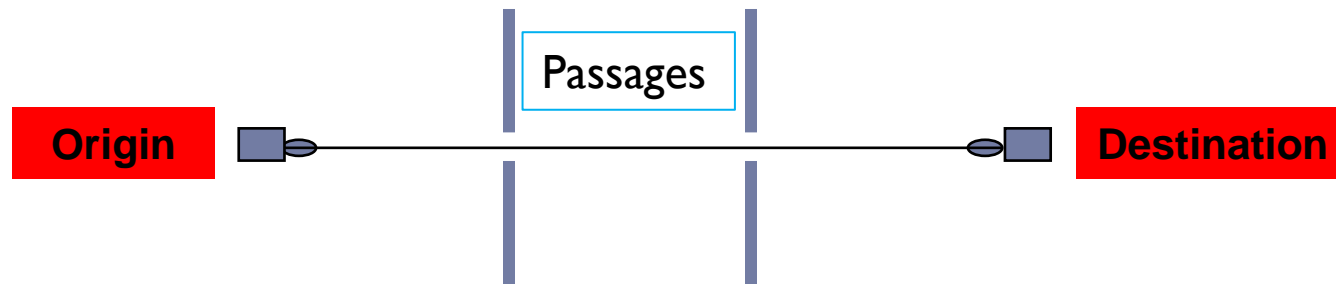
## Part 1: Main difficulties

### Identification of the unused cables

- 1) For the oldest system, nobody knows ...
- 2) Users would like to keep the cables as reserve ....
- 3) Cables without numbers, and no documentation ....

### During the works

- 1) Electrical risks,
- 2) Possibility to remove a 'good' cable.
- 3) Impossibility to remove because of the inaccessibility of the cable ladder, equipment, area, etc...



A cable is a link between 2 functional positions - origin and destination. It is defined by a type and it will be installed on dedicated cables ladders.

### **STEP 1:**

**On the base of a preliminary layout (machine and ctrl rooms), the users established a first list of new cables containing the following information: type of cable, quantity, origin and destination.**

- 1) Type of cables: following our list of standard cables (IS23).
- 2) Functional Position - origin and destination: the codification must follow the rules defined in the area.
- 3) Dedicated cables trays: Ctrl, power (DC and AC), safety and specified cables trays to avoid EMC.

Part2: Preparation

With the first information given by th users:

Supply of material

Layout

Infrastructure

Cabling

Calculation of quantities

List of racks per system

Passages Génie Civil

Price estimation

Naming of FP (Boxes)

Size of the cable ladders

Installation priorities

Ordering of material

Fonctional Position layout

3D intégration of cable ladders

Definition of the cabling compaign

Cable requests (DIC)

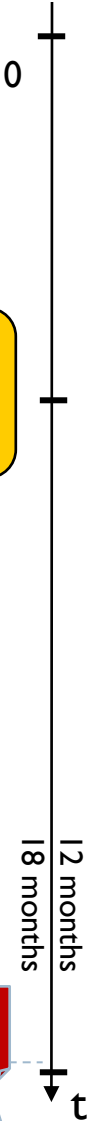
Installation of the cable ladders

Cable database preparation

Rack installation.

Worksite preparation

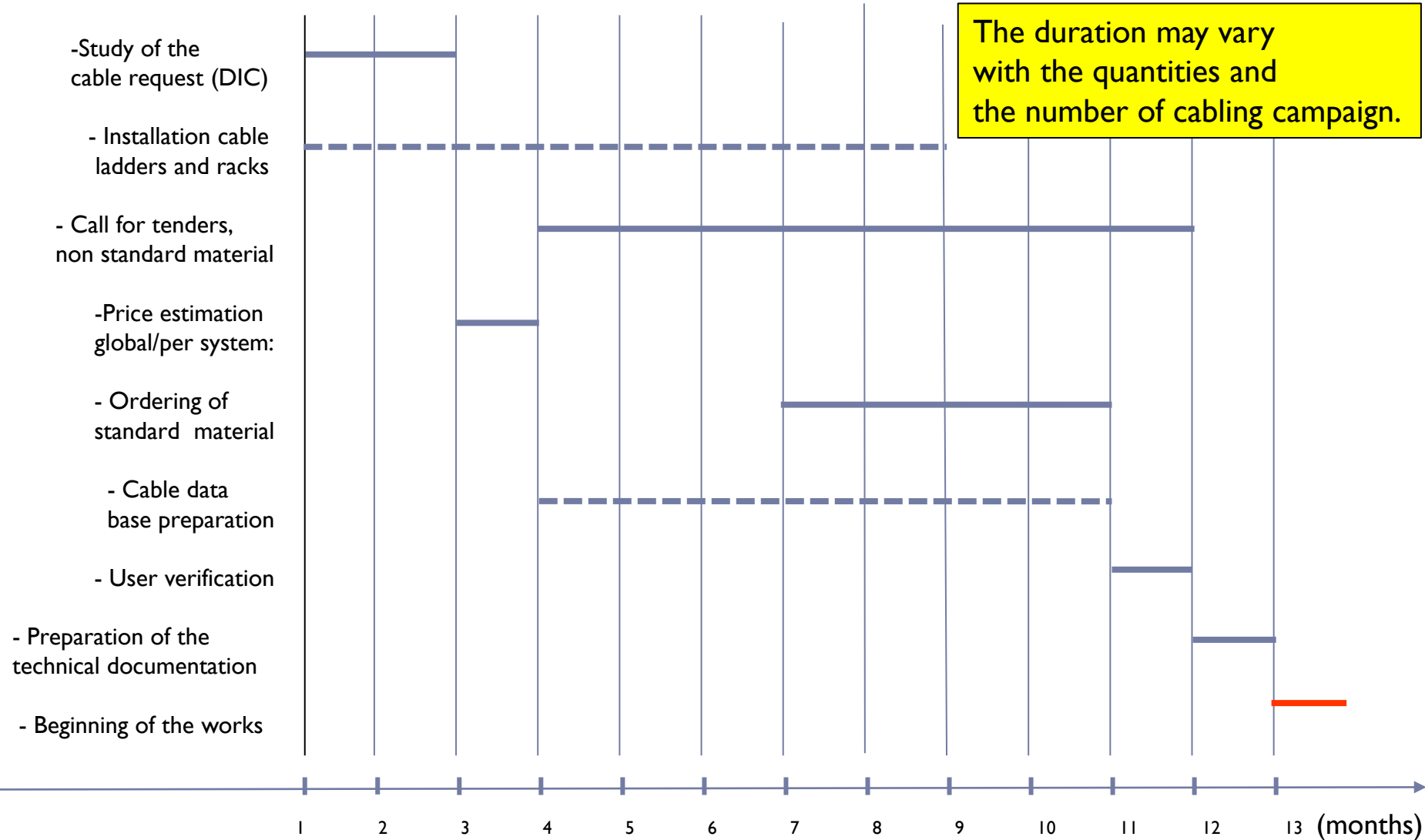
- Length estimation of each link,
- Definition of the total quantities for each item.



3/1/20...



# General schedule (Example)

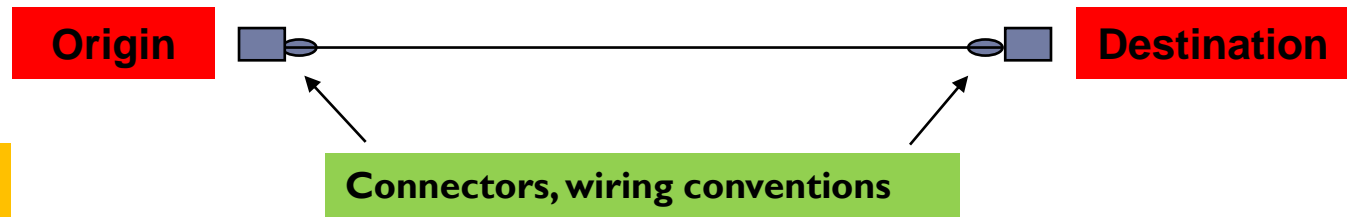


- ▶ The preparation methodology is the same that for cables:
  - Optical fibre requests: DIF - same principle as for cabling.
  - Supply of material: about 4 months for standards,  
about 12 months for special rad-resistant fibres (if required and depending on the quantities)
  - Equipment layout : same
- ▶ General schedule: same as for cabling:
  - Infrastructure: installed by 'cabling team'.
  - Optical cabling:
    - Similar constraints than the copper cabling concerning the laying of the tubes.
    - Termination/measurement requires more time in place.
- ▶ Optical fibre requests: DIF - same principle as for cabling.

NB: There are not Optical Fibres to remove.

<b>DIC</b>				<b>DEMANDE D'INSTALLATION DE CABLES</b>				DATE D'EMISSION :				VERSION		Réservé ST-EL			
DEMANDEUR :				DESCRIPTION :				FIN TRAVAUX DEMANDE :				RECU LE :					
TEL :				DIVISION :				CODE BUDGETAIRE :				No. DT :					
BEEP :				GROUPE :				NOM SIGNATURE AUTORISE :				AFFAIRE :					
<b>Comments: Constraints about the cable lengths, sensibility to the EMC, etc...</b>												ACTIVITE :					
												OSE :					

**Technical details**



**Code 'ouvrage'**  
**Functional position**  
**Element**

No. Cable (par EN-EL)	No	5	4	20			6			12			12			3			4			7			7			LON- GUEUR
		CABLE	SEAU	FONCTION DU CABLE			OUVRAG	Position	Fonction.	ELEMENT	POSV	POSH	CONNECT	CONVN	OUVRAG	Position	Fonction.	ELEMENT	POSV	POSH	CONNECT	CONVN						
1																												
2																												

**Code of the cable.**  
**Fonction of the cable: 45 caract. max**

**Building: Code 'ouvrage' civil engineering**  
**Functional position: Rack, cabinet, magnet, etc...**  
**Element: Electronic crate, etc...**

**Code of the connectors: See list**  
**Wiring connection: See list.**

**Information concerning pos. of the connector in the extremities.**

**Cable number, code 'réseau', length: Define par EN-EL**

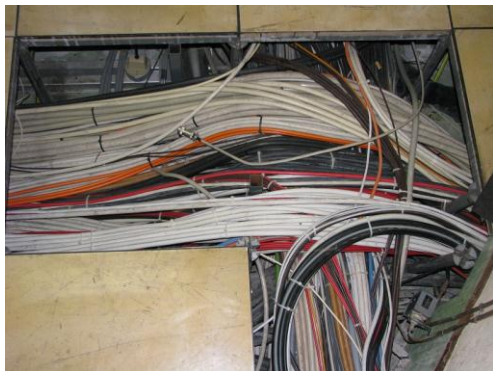
Installation: 1968

Cables: Oldest are with halogen.

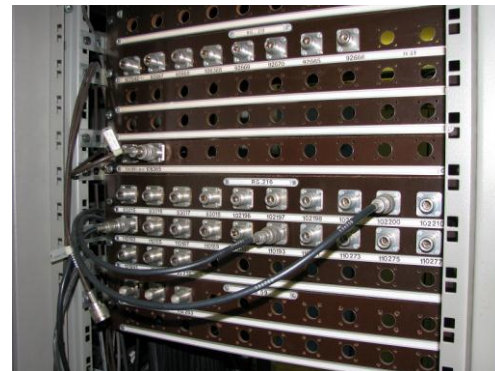
A lot of cables have been pulled between the control rooms :  
PS Ring Center, Li2, CCR (354), MNR, etc..

Removing of old cables: A campaign took place during the 90'.

A new one is now necessary.



PP Booster



PP 354



Documentation:

- Layout of the BCER, BOR, BAT exists: (Drawings PS\_EY\_\_\_7001, 7002 and 7012)
- Integration of the cables trays exists on Euclid.

Cable data base:

- All the cable modified or installed after 1989 are inserted in the cable data base (= 6000 cables)
- All the cable installed before 1989 are documented in hand-written lists (= 11000 cables)

## Conclusions

- The methodology for the removal of the unused cable is well known. It is based on the experience of the large cable removal carried on in the 90's on the PS site.
  
- The methodology exposed for the installation of new projects have been already experimented in the AD, LHC, Linac4 etc...

Thank you for your attention.