



QUALITY PROCESS FOR CERN

E. LIENARD 28/03/2023



What does “CERN” stand for?

**European Organization
for Nuclear Research**

1954

Nuclear?



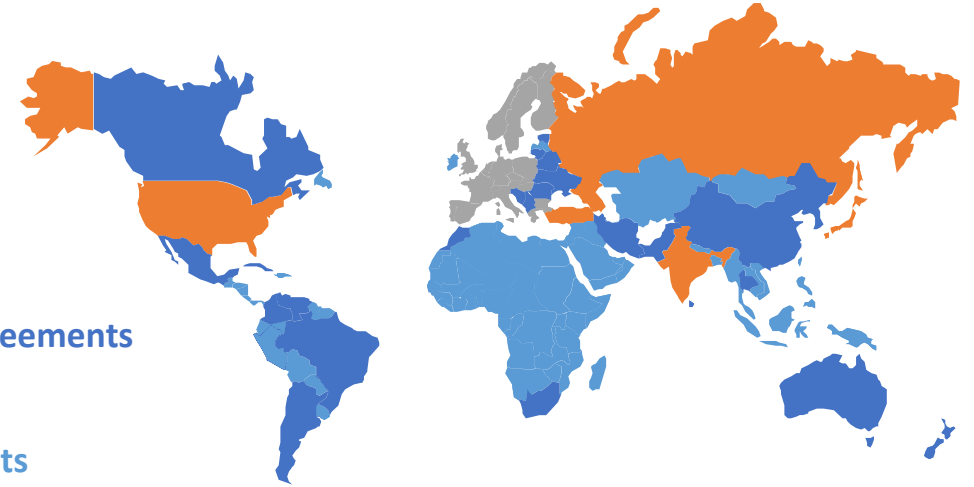
European laboratory for particle physics

The largest particle physics laboratory in the world

23 member states



| | |
|----------------|--|
| Germany | |
| France | |
| United Kingdom | |
| Italy | |
| Spain | |
| Netherlands | |
| Switzerland | |
| Belgium | |
| Poland | |
| Sweden | |
| Norway | |
| Austria | |
| Denmark | |
| Greece | |
| Finland | |
| Portugal | |
| Israel | |
| Czech Republic | |
| Hungary | |
| Slovakia | |
| Bulgaria | |



Associates

Cooperation agreements

Observers

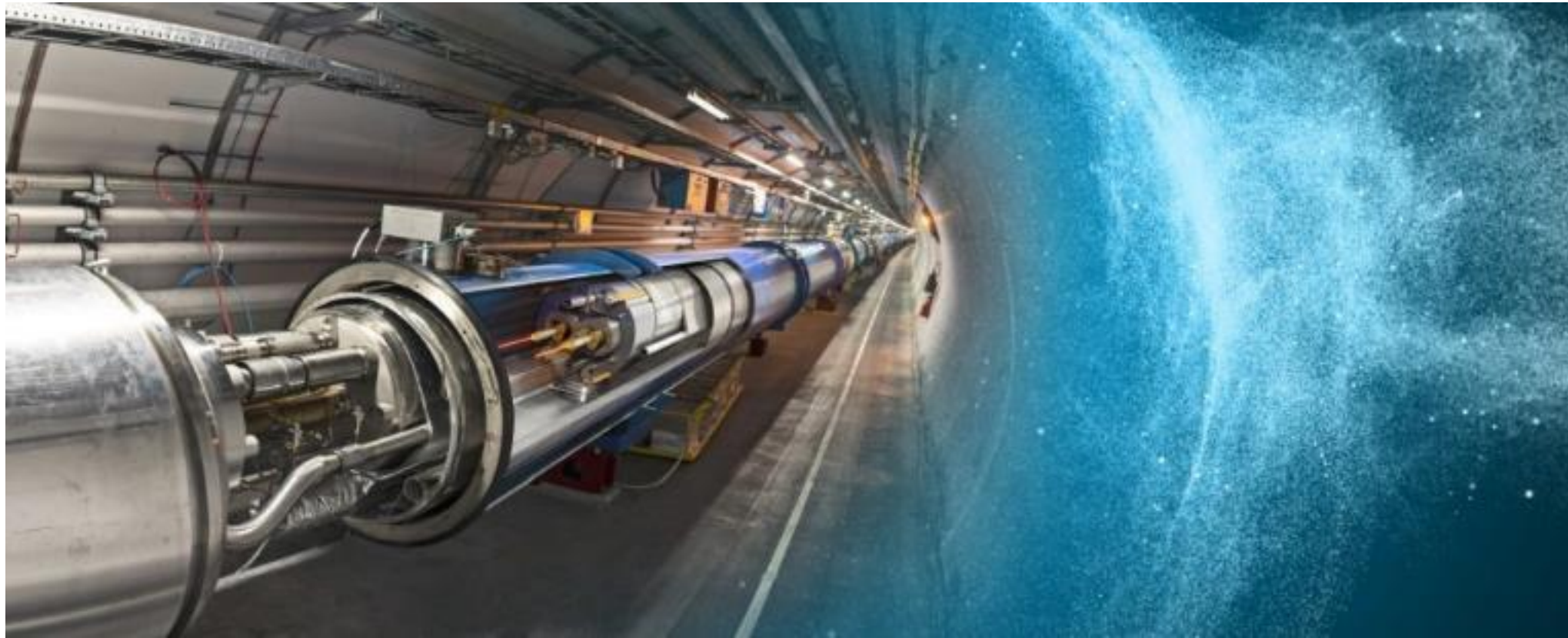
Scientific contacts

How many people?

- 2'500 staff
- 600 Fellows & apprentices
- 500 Students
- 11'000 users
- 2'000 external companies

+15'000!

How does it work?





The **most powerful** magnets



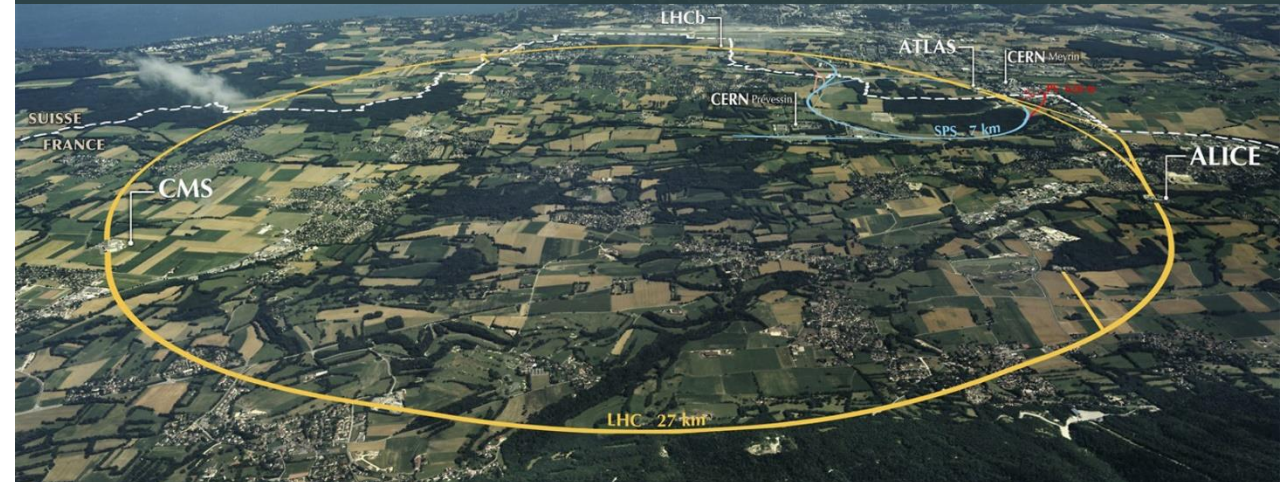
The **highest** vacuum



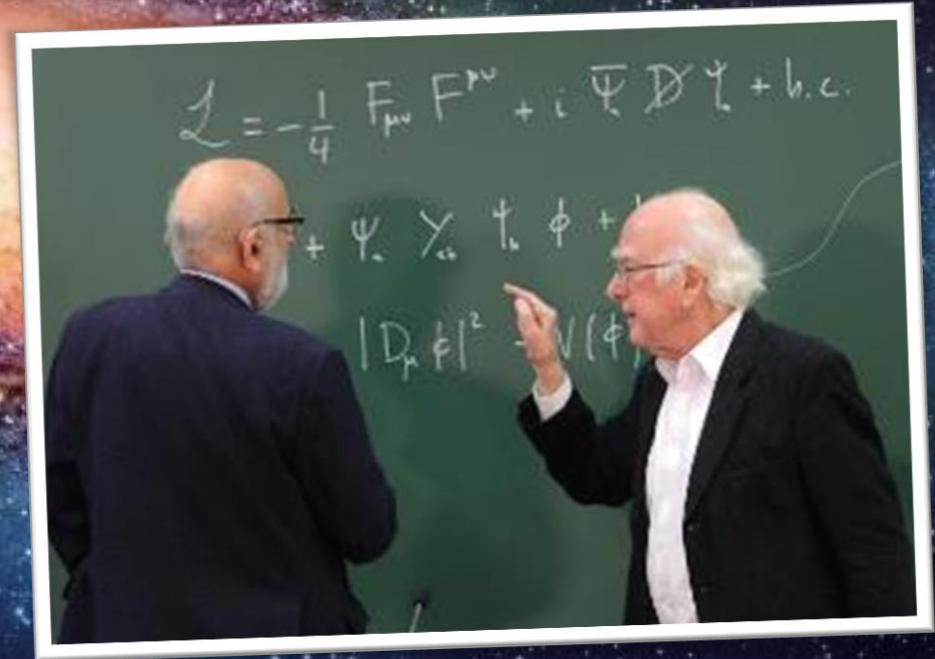
The **coldest** place in the universe



The **largest** particle accelerator



Answering fundamental questions...



What is the Universe's mass made of?
Where has all the primordial antimatter gone?

What was the state of particles just after the "Big Bang"?



How we do the **Quality** process?

What is quality?

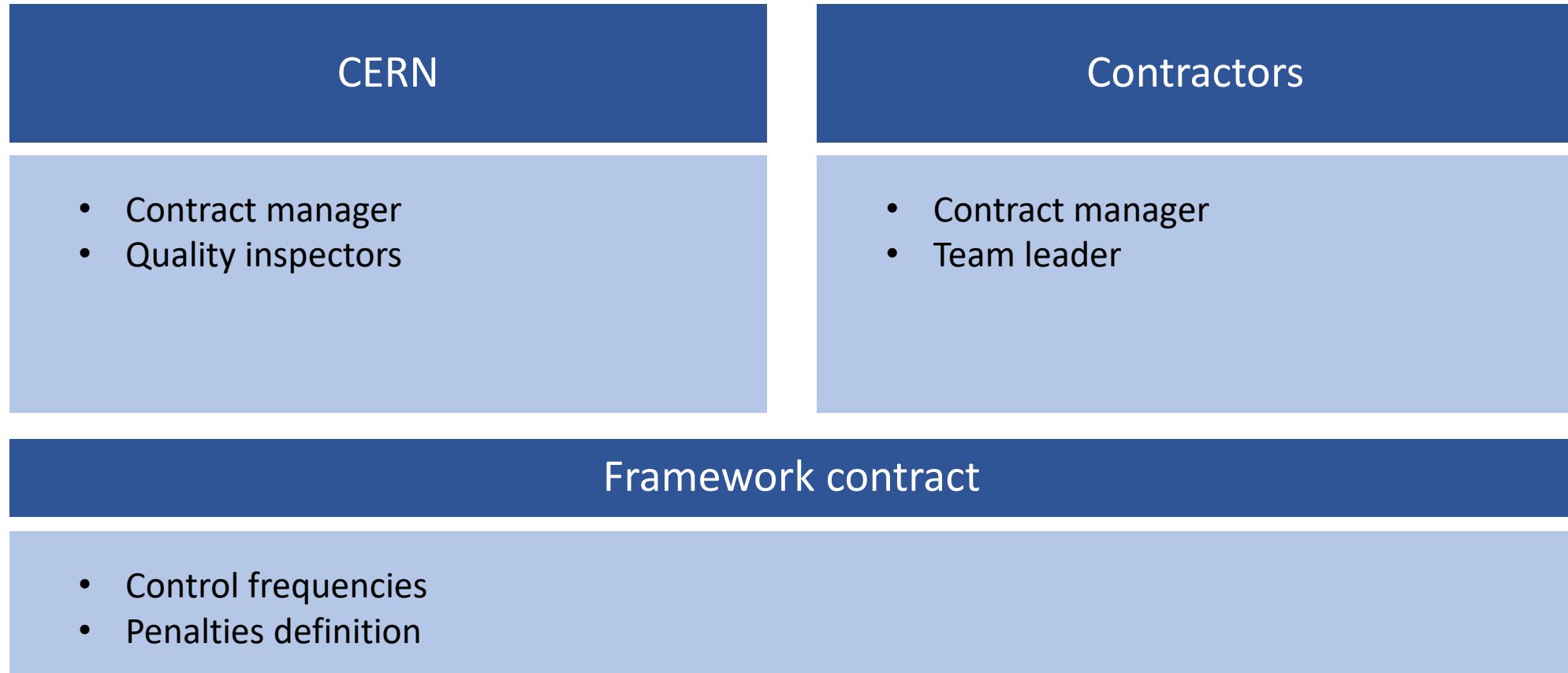
Word **quality** can have different meanings...

- « Meeting the requirements »
- « To do things right from the first time »
- « What everybody wants, but only a few dare to pay for »

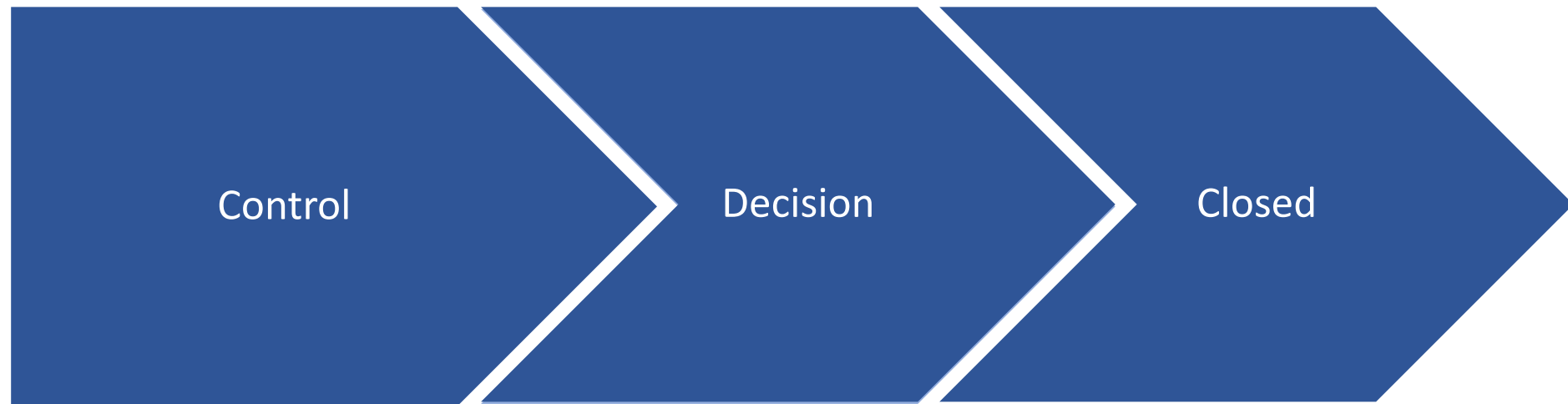
In general,
the quality can be defined as **degree of customer satisfaction**.



CERN Stakeholder involved in quality management:



Control Quality Management Process



Phase 1: Control

The control is done through a dedicated web interface (**record producer**) in ServiceNow

The frequency of these controls are based on:

- Contract requirements
- A negative feedback or complaint
- Preventive

The result of the control is generating a **CQM ticket**

Phase 2: Action

A chance to recover the shot...

Depending of the contract conditions,

- Corrective actions can be requested to the contractor
- A non compliant CQM ticket can be corrected*
- The contractor must indicate or contest the agreement declared in the control result

Phase 3: Decision

THE critical one...

- This step is **always** done by the CERN contract group.
- CERN has **always the last word**, in accordance with the terms of the existing contract
- CERN must decide if penalties are applied or not.

Phase 4: Closed

Too late...

- The CQM ticket is closed, **no more modifications** are allowed.
- It will count in the contract review meeting.

The image features a teal background with a white curved line separating the top half from the bottom half. The text 'Now...the reality' is positioned in the lower-left area, with 'Now' in green and the rest in black.

Now...the reality

Two concrete examples

| CERN cleaning contract | Active |
|---------------------------------------|--------|
| Preventive Control | ✓ |
| Frequency of controls based on time | ✓ |
| Frequency of controls based on volume | ✓ |
| CERN or contractor control initiation | ✓ |
| Linked to a existing ticket | |
| Weight for each questions | ✓ |
| Global weight of the control form | |
| Action possible | |
| Penalties | ✓ |
| Review meeting | ✓ |

| CERN Service desk contract | Active |
|---------------------------------------|--------|
| Preventive Control | |
| Frequency of controls based on time | |
| Frequency of controls based on volume | ✓ |
| CERN or contractor control initiation | ✓ |
| Linked to a existing ticket | ✓ |
| Weight for each questions | |
| Global weight of the control form | ✓ |
| Action possible | ✓ |
| Penalties | ✓ |
| Review meeting | ✓ |

Volumetry...overview

Cleaning surface to be done on CERN sites:

- 433 357.59 Square meters

Number of tickets handled by the Service desk yearly

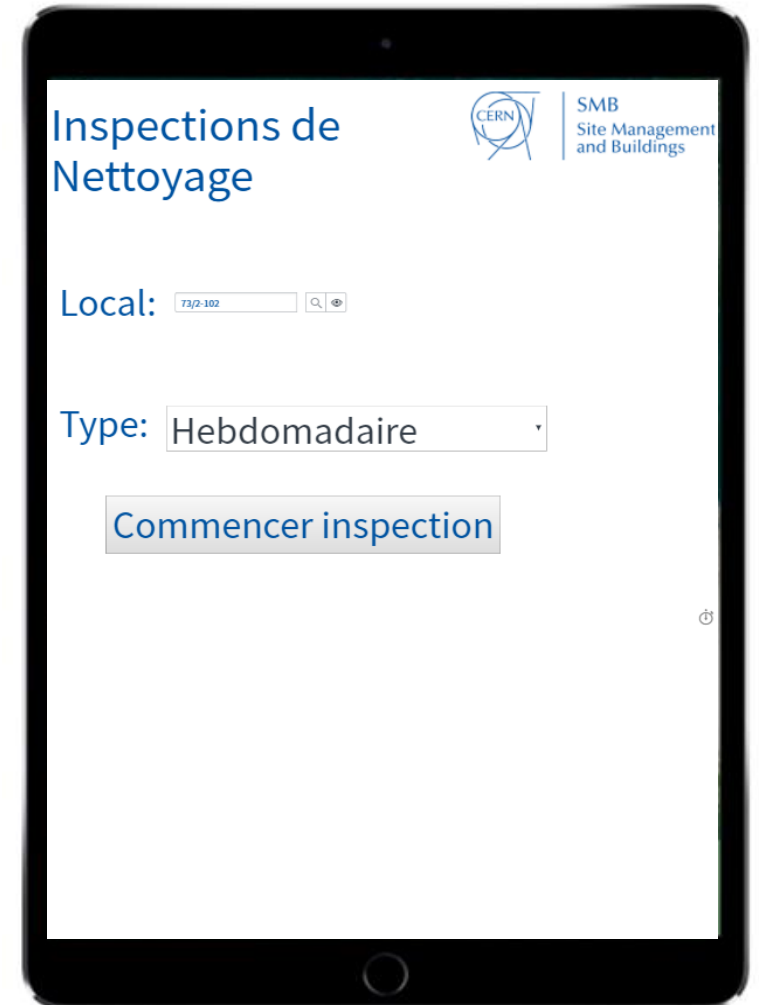
- 190 000 / year

Cleaning contract **Control** form

- Initiated manually on-demand
- Created by contractor or controller
- Created on mobile device
- Can be linked to a ticket (INC or RQF)
- **Must be geolocated**

Frequency requested:

- 500 Square meter per day
- After each thorough cleaning



The image shows a tablet displaying a mobile application interface for 'Inspections de Nettoyage'. The interface includes the CERN logo and 'SMB Site Management and Buildings' in the top right corner. Below the title, there is a 'Local:' field with a text input containing 'T3/2-102' and a search icon. Below that is a 'Type:' dropdown menu currently set to 'Hebdomadaire'. At the bottom of the form is a button labeled 'Commencer inspection'. A small globe icon is visible in the bottom right corner of the screen.

Cleaning contract **Control** form... **result**

The compliance is calculated, based on the **sum** of the result of each question



- Result < 1 = Non-compliant
- Result > 1 = Compliant

Cleaning Inspection Sanitaire

Please answer all the questions for the existing points in the location. Do not answer any if the point does not exist.

Ticket:

Location:

Country:

Inspection Type:

Inspection Threshold:

Surface:

* Preventive Inspection:

VOLUME
VOLUME / Absence toiles d'araignée?
 Yes No
Comments:

SOL - REVETEMENT DUR ET CARRELE
SOL - REVETEMENT DUR ET CARRELE / Absence poussière?
 Yes No
Comments:
SOL - REVETEMENT DUR ET CARRELE / Absence salissures?
 Yes No
Comments:
SOL - REVETEMENT DUR ET CARRELE / Absence traces de lavage?
 Yes No
Comments:

MURS - CLOISONS - PLINTHES
MURS - CLOISONS - PLINTHES / Absence poussière?
 Yes No
Comments:
MURS - CLOISONS - PLINTHES / Absence salissures?
 Yes No
Comments:
MURS - CLOISONS - PLINTHES / Absence traces de lavage?
 Yes No
Comments:

Service Desk contract Control

- Initiated manually on-demand
- Used on the ServiceNow tool
- Can be link to a input (INC,RQF, feedback, phone call)

Frequency requested:

3% of the global volume threatened

SD Quality Check

Please, complete and submit this form.

Control type: Ticket
Agent: -- None --

Ticket number: INC0542308

Written / Oral Communication

Written / Oral Communication Fulfilled: Written / Oral communication fulfilled quality requirements

Written / Oral Communication Failures:

- English or French Language level failure
- Oral and written communication issue (politeness, etc.)
- Inappropriate or lack of usage of templates available in the TKS

Written / Oral Communication - Comments

CERN Service Catalog

CERN Service Catalog Usage Fulfilled: CERN Service Catalog usage fulfilled quality requirements

CERN Service Catalog Usage Failures:

- Inappropriate or lack of usage of knowledge base
- Inappropriate or lack of usage of keywords
- Inappropriate or lack of usage of service / function description

CERN Service Catalog usage - Comments

Caller Communication

Caller Communication Fulfilled: Caller Communication fulfilled quality requirements

Caller Communication Failures:

- Wrong information provided to callers
- Set of questions not asked to callers
- Failure in understanding issues reported by callers
- Very dissatisfied or dissatisfied satisfaction rate

Caller Communication - Comments

Ticket Classification

Ticket Classification Fulfilled: Ticket Classification fulfilled quality requirements

Ticket Classification Failures:

- Failure in the classification of tickets (Incident versus Request and vice-versa)
- Failure in providing a meaningful short description of the issue
- Failure in providing the appropriate issue location
- Failure in managing the "Impact" and "Urgency" of an issue in the TKS
- Failure in ensuring proper communication with "Guest" callers (Caller and Watchlist fields)

Ticket classification - Comments

Service Desk contract Control... result

The compliance is directly known if **one and only one** question is failing



- Result = 0 => Compliant
- Result = 1 => Non-compliant

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Please, complete and submit this form.

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Agent: --None--

Ticket number: INC0542308

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Ticket classification - Comments

Service Desk contract **Action** phase

The screenshot shows a web interface for a Service Desk contract in the 'Action' phase. The breadcrumb trail at the top indicates the process flow: Control (checked) → Action (highlighted) → Decision. The form is divided into several sections:

- Fields to be filled in the "Action" stage:** Includes fields for Action Group (DCS Service Desk (S183) Quality control), Action Responsible, and Action Result (Non Compliant (NC)).
- Fields to be filled in the "Decision" stage:** Includes fields for Decision Group (CERN Service Desk (S183) Quality control), Decision Responsible, Decision Result (Non Compliant), and Penalty Points (0).
- Information about the Quality Control:** Includes fields for Contract (S183), Control Type (Ticket), Related Ticket (INC1569096), Quality Controller Group (CERN Service Desk (S183) Quality control), Quality Controller (Barbara Brugger), and Control Result (Non compliant).
- Compliance Discussion Form:** A tabbed form with an 'Activity' tab selected. It contains a text area for 'Additional comments (Customer View)' with 4000 characters left, and a timestamp: '01-02-2018 10:38:16 - Barbara Brugger' with a link to a knowledge base article.

Annotations with red arrows and numbers 1-4 point to specific elements:

- 1:** Points to the 'Action Group' field.
- 2:** Points to the 'Related ticket assigned to' field.
- 3:** Points to the 'Additional comments (Customer View)' text area.
- 4:** Points to the 'To Decision' button in the top right corner.

Buttons at the bottom of the form include: Print form, Update, Save, To Decision, and Delete.

1. Only the concerned contract manager can validate the form
2. All requested actions are visible in the tab form (Control form RP)
3. All his additional comments will goes there
4. Decide to save or going to next step?

Service Desk contract Decision phase

The screenshot shows a web interface for a Service Desk contract in the 'Decision' phase. The top navigation bar includes a breadcrumb 'QM0023004 - State: Decision' and buttons for 'Update', 'Close', 'Restart process', 'Save', and 'Delete'. The main content area is divided into two columns: 'Fields to be filled in the "Action" stage' and 'Information about the Quality Control'. The 'Action' stage fields include Action Group, Action Responsible, and Action Result. The 'Decision' stage fields include Decision Group, Decision Responsible, Decision Result, and Penalty Points. The 'Information about the Quality Control' section includes Contract, Control Type, Related Ticket, Quality Controller Group, Quality Controller, and Control Result. A 'Compliance Discussion' section at the bottom has a text area for 'Additional comments (Customer View)' and a list of activity entries. Red arrows and numbers 1, 2, and 3 point to specific elements: 1 points to the 'Decision Result' dropdown, 2 points to the 'Additional comments' text area, and 3 points to the 'Close' button in the top right.

Fields to be filled in the "Action" stage

- *Action Group: DCS Service Desk (S183) Quality control
- Action Responsible: Francois Robert Perez Torres
- Action Result: Compliant

Fields to be filled in the "Decision" stage

- *Decision Group: CERN Service Desk (S183) Quality control
- Decision Responsible: [Search]
- Decision Result: Corrective Action Accepted
- Penalty Points: 0

Information about the Quality Control

- *Contract: S183
- *Control Type: Ticket
- *Related Ticket: RQF0916688
- *Quality Controller Group: DCS Service Desk (S183) Quality control
- *Quality Controller: Francois Robert Perez Torres
- *Control Result: Compliant
- Results / Calculations: [Empty]

Related ticket assigned to: Laura Josie Noual

Preventive: [Empty]

Compliance Discussion | Form | Activity

Additional comments (Customer View)

Characters left: 4000

09-01-2018 13:24:05 - Francois Robert Perez Torres
RAS

Print form | Update | Close | Restart process | Save | Delete

Related Links

1. If the corrective action respond to the requested criteria
2. Reason of the decision will goes here
3. Decide to close this CQM, save as it is or restart it

Cleaning contract Decision phase

Quality Management
QM0025203 - Assigned To: Eric Admin - State: Decision

Control ✓ Action ✓ Decision

Fields to be filled in the "Action" stage

*Action Group Contract CH Cleaning Inspections quality control

Action Responsible

Action Result Compliant

Fields to be filled in the "Decision" stage

*Decision Group CERN Cleaning Inspections quality control

Decision Responsible

Decision Result Compliant

Penalty Points 0

Related ticket assigned to

Preventive No

Information about the Quality Control

*Contract S153

*Control Type Inspections

Related Ticket

Quality Controller Group CERN Service Desk (S183) Quality control

*Quality Controller Eric Admin

*Control Result Compliant

Results / Calculations 1

Compliance Discussion Form Activity

Addition comments (Customer)

Characters left: 4000

Print form Update Save in secondary Update Set Close Restart process Save Delete

1

2

3

1. The result can still be changed
2. Reason of the decision will go here
3. Decide to close this CQM, save as it is or restart it

Cleaning contract Decision phase

Quality Management
QM0028635 - Assigned To: Sandra Marisa Pereira Rodrigues - State: Decision

Control ✓ Action ✓ Decision Closed

Fields to be filled in the "Action" stage

*Action Group Contract CH Cleaning Inspections quality control

Action Responsible

Action Result Non Compliant (NC)

Information about the Quality Control

*Contract S153

*Control Type Inspections

Related Ticket

*Quality Controller Group Contract CH Cleaning Inspections quality control

*Quality Controller Sandra Marisa Pereira Rodrigues

*Control Result Non compliant

Results / Calculations 0.8

Fields to be filled in the "Decision" stage

*Decision Group CERN Cleaning Inspections quality control

Decision Responsible

Decision Result Non Compliant

Penalty Points 0

Related ticket assigned to

Preventive No

Compliance Discussion Form Activity

Additional comments (Customer View)

Characters left: 4000

Print form Update Close Restart process Save

1. The result can still be changed
2. Reason of the decision will go here
3. Decide to close this CQM, save as it is or restart it

Cleaning & Service Desk contract **Closed** phase

Quality Management
QM0025203 - Assigned To: Pablo ADMIN - State: Closed

Control ✓ Action ✓ Decision ✓ Closed

Fields to be filled in the "Action" stage

| | |
|--------------------|--|
| *Action Group | Contract CH Cleaning Inspections quality control |
| Action Responsible | |
| Action Result | Compliant |

Fields to be filled in the "Decision" stage

| | |
|----------------------------|---|
| *Decision Group | CERN Cleaning Inspections quality control |
| Decision Responsible | Pablo ADMIN |
| Decision Result | Compliant |
| Penalty Points | 0 |
| Related ticket assigned to | |
| Preventive | No |

Information about Quality Control

| | |
|------------------------|--|
| *Contract | S153 |
| *Control Type | Inspections |
| Related Ticket | |
| Quality Control Group | CERN Service Desk (S183) Quality control |
| *Quality Control | Eric Admin |
| *Control Result | Compliant |
| Results / Calculations | 1 |

Compliance Discussion Form Activity

Print form Update Save in secondary Update Set Restart process Save Delete



Technical implementation

- **Tables:**

Creation of Quality Management (u_quality_management) table to build the CQM process.

This table inherits from Task (able to use any field contained in Task)

- **Roles:**

New role called "quality_controller" created.

Nobody without this role will be able to see the application or to make CQM tickets.

- **Script includes, Business rules, Client scripts**

e.g: Business logic, Assure tickets belong user contract, reset penalties...

ServiceNow new application menu

1. CQM tickets under contracts managed by myself
(Both CERN and External quality groups)
2. CQM tickets assigned to one of my quality groups
3. CQM tickets I am currently working on.
4. Dedicated admin menu

The screenshot shows the 'Quality Management' application menu in ServiceNow. The menu is structured as follows:

- Quality Management
 - SD Quality Check
 - ▼ Assigned to My Contracts
 - All active
 - Control
 - Action
 - Decision
 - Closed
 - ▼ Assigned to My Groups
 - All active
 - Control
 - Action
 - Decision
 - Closed
 - ▼ My work
 - Control
 - Pending Assess
 - Pending Decision
 - ▼ Quality Development
 - QM - Script Includes
 - QM - Client Script
 - QM - UI Policies
 - QM - UI Actions
 - QM - ACLs
 - QM - Business rules
 - QM - Properties
 - QM - Filters
 - QM - UI Pages
 - QM - UI Messages
 - ▼ Quality Admin
 - Create New

Value Outcomes

| | Before | After |
|--|------------------------|--|
| what we pay is what we have | No idea | More often (still sampling) |
| formalize the quality of the work expected | tacit | established based on quality criteria |
| proactive approach | No benchmark available | Regular measure taken so now we see that there is room for improvement (K.B) |

Our Goals

The main objective is:

- The continuous improvement process
- Quality control for end users

AND it is **not**:

- to act as policemen to monitor our contractors
- A simple way to save money!

Q & A