CONTINGENCY PLANNING of AIR NAVIGATION SERVICES

SASI Workshop

Real Case

Incompleteness of Contingency procedures

(Malfunction of No-Break Generator in ACC)

Gerald Amar – Project Manager

gerald.amar@eurocontrol.int

http://www.eurocontrol.int/ses/public/standard_page/sk_sesis_guidelines.html

Status of Power Supply System – May 2008

Power Supply Station is located near the ACC building and consists of :

- Transformer station and
- Generator station including
  - automatic generator and
  - two no-break generators.

The system was installed in 1974.

Switching boxes of PS Station supplies in ACC building:

- Main switching locker and
- UPS (2 pcs).

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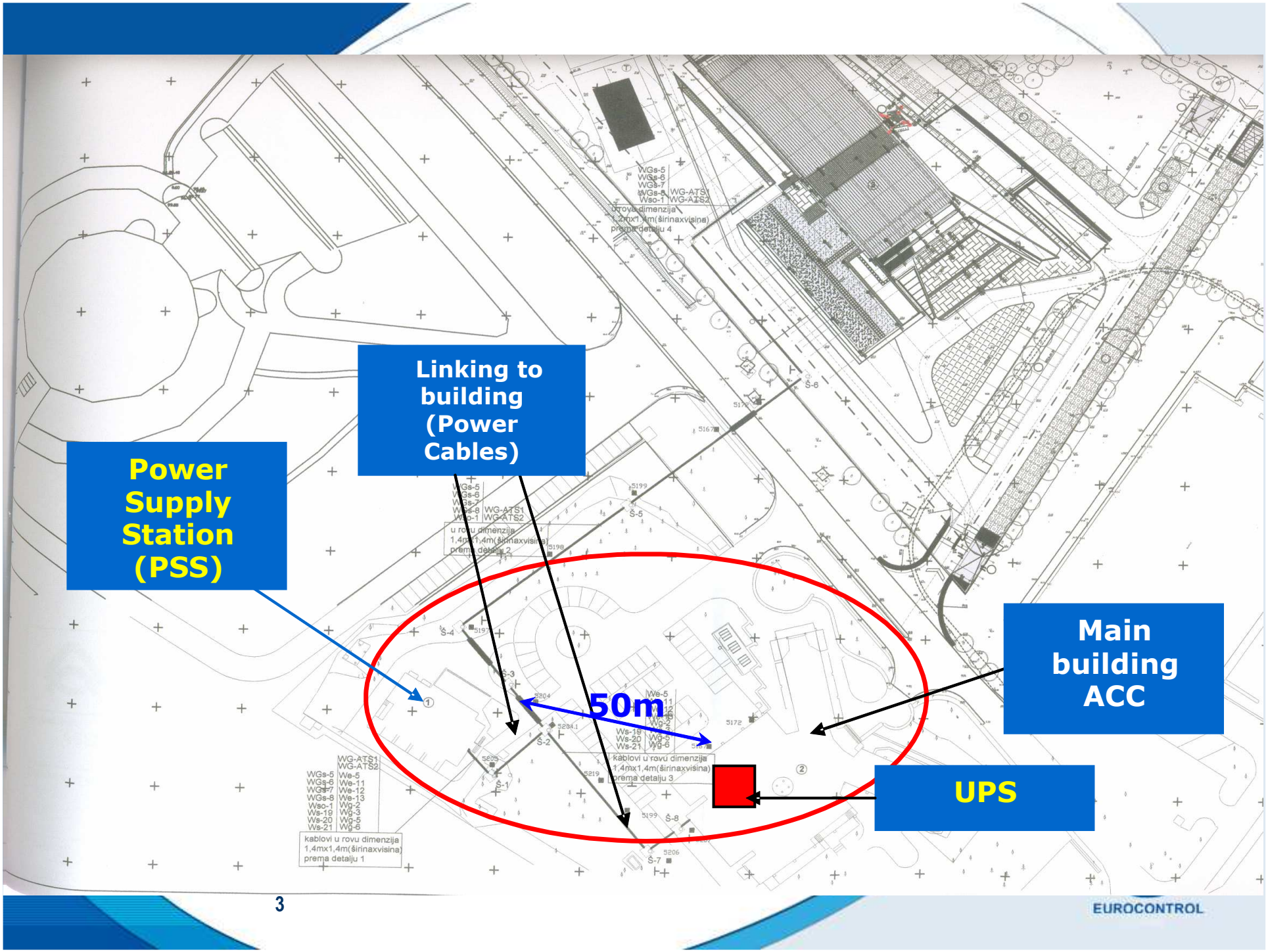
Linking to building (Power Cables)
Power Supply Station (PSS)
Main building ACC
UPS
50m

Modernisation of Power Supply System

Over 30 years long life cycle of PS equipment:

- Upgrade of PS system and tender documentation has been accomplished by the end of 2004;
- And procurement of new equipment in 2007.
- Installation of new equipment scheduled for June 2008.
- Operation for July 2008.

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ATM Occurrence – May 2008 (1/3)

14:25 UTC - Appearance of alarm on Remote Control Unit in PS Station from UPS located in ACC building.

- Technician on duty goes to ACC building to check UPS and detects the following:

1. Warning on UPS display:
   <Power Supply is out of tolerance >

2. UPS operates on battery supply

3. UPS autonomy - 13 minutes

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ATM Occurrence – May 2008 (2/3)

14:30 UTC - Technician goes back to PS Station.

- He informs Technical Supervisor about the problem and then,
- he calls Head of department who is **not** accessible.

14:32 UTC – In ACC building again, Technician detects «UPS autonomy - 6 minutes »

and makes an erroneous decision to switch the PS users to stand-by UPS (n°2);

Technician on duty switch UPS No.1 on static bypass configuration and then attempted to switch the PS users to stand-by UPS No.2.

It gives passage of voltage from Generator direct to Users, without stabilization.

Consequence

Operational facilities are exposed to high voltage over tolerance,

which cause equipment outage because of failure of AC adapters:

- Linear power suppliers,
- Radar data distributors
- and Commutation modules.

ATM Occurrence – May 2008 (3/3)

14:35 UTC - In a few minutes collapse of:

- » three quarters of Radar Data Displays,
- » one half of Flight Data Displays,
- » all radar inputs in DPS,
- » few Controller Working Positions for Voice Communication System
- » and AFTN connection with ARO & NOTAM.

14:40 UTC - Technical Supervisor informs ATC Supervisor that problem will last at least another 30minutes.

14:45 UTC - ATC SUP decides to close FIR announcing to CFMU traffic zero.

Actions at the OPS room

- In accordance with Contingency procedure,
- ATCOs were instructed to switch on stand-by VHF/UHF battery stations.
- By phone, ATC SUP
  - Contacted all neighbouring FIR and requested to widen radar picture scope to monitor traffic in conflict (if there was any).
  - Contacted the airport to stop departing traffic

- Out of any Contingency procedure:
  - an action was taken by one ATCO to switch on to nearby working VCS panel because:
  - although Stand-by VHF/UHF battery station were operating normally, the frequency coverage was reduced due terrain and particular position of conflicting traffic;
  - The ATCO continued instructing aircraft, and after that, separation was managed correctly.

What do you think of this case ??

What are the causes ?

What went right ?

What went wrong ?

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Causes (as identified by the ANSP)

No-break Generator (over 30 years in exploitation) had only undervoltage protection and **did NOT** have **OVERVOLTAGE** protection.

No remote monitoring of allocated UPS:

- Only alarm: manufacturer required extra training for technicians and extra payment,
- so **15 minutes of UPS autonomy** passed quickly in running between two buildings.

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Causes (as identified by the ANSP)

Technician on duty (3 years of experience):

- forgot mobile phone;
- lost time as well as his superior was not accessible;

Loss of time put Technician under stress situation.

He made an erroneous decision although he had two correct options:

- to supply load (PS Users) from Mains
- or to supply Load from Mains and after that from another no-break Generator

Most important factor for this ATM occurrence is that:

- Operational and Contingency procedures for CNS-Power Supply System, did not consider overvoltage situation in that particular way.

Some inputs for thinking

Operational contingency went **well**,

- However, one ATCO continued control two aircraft in conflict had to use a procedure not documented in the CP;

=>>Contingency Procedures were incomplete

Technical contingency procedures went **wrong**:

- Case of « Overvoltage» not foreseen;
- Time of protection from UPS lost in runs between buildings.

=>> lack of testing procedure;

=>> and training of technicians;

- Telephone forgot and stress:

=>> Technicians are required to carry mobile telephones.

Contingency is a Crisis

=>> Clear allocation of responsibilites;

=>> Deciders should be always accessible;

Conclusions

This case is a classical example of coinciding “holes” (Reason’s “Swiss Cheese” model);

However “largest hole” could cover the “whole applicable procedure”.

Difficult to foresee all situations and possibilities;

Nevertheless, we have to do our best:

- Constantly reviewing Operational and Contingency procedures;
- Testing and training of Contingency procedures;
- Maintain knowledge and practices of Operational and Technical personnel via “refreshment training”.

From the ANSP concerned …

Some Technical contingency procedures have been changed or created

Eurocontrol Guidelines for Contingency Planning, used: "Planning" § 7, "develop or change contingency plan(s)".

These Guidelines are very good material.

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