MOBILE UNIT FOR OPERATIVE INTERVENTIONS IN HAZARDOUS SITUATIONS OF CONTAMINATION

D. GALVAN - G.F. MARCOALDI - A. BAZZAN

E.N.E.A.

In case of an accident having, as main effect, the release in the environment of a radioactive or conventional contamination, the consequent intervention develops, normally, in three subsequent stages.

Stage 1. - First intervention, following immediately the accidental event, having as principal aim the rescue of the operators eventually involved.

Stage 2. - This stage is very often the most important (except in case of instantaneous release) because of the major release of the contaminant.
The principal goal to achieve in this situation is to stop the event's evolution.
It becomes therefore important to achieve the following results:

a) Turning off the apparatus to avoid the risk of further evolution.
b) Safety and control of the whole facility and components liable to be involved or damaged.
c) Shielding of eventual irradiation sources.
d) Complete survey of contamination and, eventually, external irradiation.
e) Complete survey by means of TV images and collection of data about incidental site and the surrounding area.
f) First operations of decontamination or bordering, creating support areas for following interventions.

Stage 3. - During this stage, having complete information about the accident and its consequences, the decontamination operations can start to restore the original conditions of the site.

Generally, in typical accidental situations, the existing structures are able to carry out stages 1 and 3. Only in very special cases the facility has locally complex and protected apparatus suitable to manage stage 2.

Operative Health Physics Service, by E.N.E.A. Casaccia Centre (Rome-Italy), with the purpose of allowing efficient and effective intervention during a "stage 2" situation, realized a Mobile Unit, completely autonomous, able to intervene in safety conditions.

The Mobile Unit consists in a large van and a trailer where all technical equipments and instruments are located. Its design assures the safety and protection of the intervening operators and their foundamental functions: breathing, speaking, working. In fig. 1 it is shown a block diagram of the installed equipments.

The Mobile Unit, with a minimum team of three operators, is able to operate indipendently even inside a toxic or radiotoxic cloud.

The Unit provides continuously the operators with fresh air, tele-communication and TV connection.

At the end of the intervention, operators and Unit can be easily decontaminated by its own decontamination apparatus and be ready for a new timely intervention.

The Unit assures - in EMERGENCY SITUATIONS - the following results and advantages:

- Direct interventions on facilities involved
- Acquisition of TV images and data about the involved site
- Timely transmission of the obtained information to the Public Authorities, for the following civil defence actions
- First decontamination actions preparing following interventions.

In CONVENTIONAL SITUATIONS:

- Decommissioning operations
- Environmental measurements programs

CONCLUSIONS

The Mobile Unit, equipped with an absolute filter system and having long autonomy, is able to operate, inside a toxic or radiotoxic cloud, in many incidental sites.

e.g.: Nuclear or chemical plants, ship holds, tunnels, places saturated by toxic substances.

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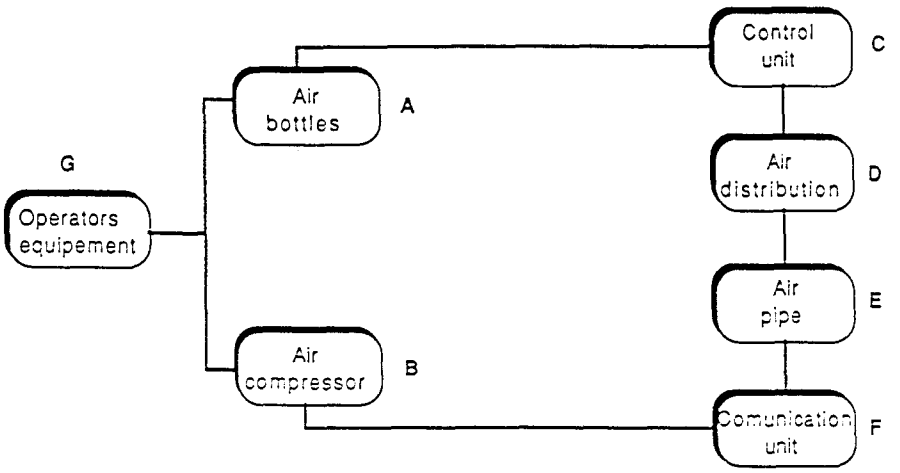
Fig. 1 - AIR DISTRIBUTION SYSTEM



To allow the UNIT FULL operation the following devices are working

H
Generators

I
Supply batteries

L
Batteries for intern.-extern. devices

M
Water group for decontam. and washing

N
External light

O
Absolute filter system

P
Supply aqualungs

Q
Radiotelephon connected with national and intern. network

R
CCTV video recorder

S
Instrumentation for internal and external controls

T
Special equipments for different type of protection