

# GRS

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## SAFETY CODES AND GUIDES - TRANSLATIONS

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vom 17. Mai 1979

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**Gesellschaft für Reaktorsicherheit  
Köln**

The German original of this translation was published in  
Gemeinsames Ministerialblatt 1979, p. 161.  
In case of discrepancies the German text shall prevail.

**INTERPRETATIONS OF THE SAFETY CRITERIA FOR NUCLEAR POWER PLANTS**  
of May 17, 1979

1. **Interpretation of Safety Criterion 2.6, "Effects from External Events"**  
- Principles for the Determination of Dangerous Materials as Defined in Safety Criterion 2.6 as well as for the Establishment of the Necessary Protective Measures against these Materials - (Status: May 17, 1979)

Dangerous materials are such materials whose effect will interfere with the adequate assurance of the function of safety-related plant components or the shift personnel's required capability of action. The following dangerous materials shall be distinguished:

1. Materials involving a short-term or long-term action that may result in a failure of the function of safety-related plant components. They include
  - explosive<sup>1)</sup> materials,
  - easily inflammable or inflammable materials<sup>2)</sup>,
  - materials displacing or consuming the Oxygen contained in the diesel supply air,
  - obstructing materials or
  - corrosive materials; and
2. Materials whose effect will interfere with the adequate assurance of the shift personnel's required capability of action. They include
  - toxic<sup>2)</sup> materials,
  - narcotic materials,
  - caustic<sup>2)</sup> materials,
  - materials displacing oxygen,
  - materials consuming oxygen or
  - explosive<sup>1)</sup> materials.

These materials may get into the nuclear power plant with the outside air for the control room and for buildings with safety-related plant components, with the combustion air supplied to the emergency power generators and with the cooling water supplied to safety-related plant components. They may interfere with the function of safety-related plant components or the shift personnel's required capability of action to such a degree that the safety of the nuclear power plant may be endangered.

The establishment of the necessary protective measures against the effect of dangerous materials shall be based on the following aspects:

- the occurrence of site-related dangerous materials (stationary or on traffic routes)<sup>3)</sup>,
- their possibilities of getting into the plant,
- their effect mechanisms including the respective time histories (e.g. of concentration or of effect) and
- the possibilities of identification and monitoring as well as
- the point of time when the protective measures become effective.

To identify the occurrence of dangerous materials and to initiate protective measures, corresponding organizational precautions and, to the extent required and possible, engineered features shall be provided.

Depending on the effect of the dangerous materials, the

<sup>1)</sup> "Explosive" as defined in the Guideline Relating to the Protection of Nuclear Power Plants against Shock Waves Caused by Chemical Reactions ( Bundesanzeiger No. 179 of September 22, 1976, p. 1-3).

<sup>2)</sup> "Easily inflammable", "inflammable", "toxic" and "caustic" as defined in Sec. 1, para. (1), subparas 3, 4, 5 and 7 of the Ordinance on Dangerous Materials of September 8, 1975 (Bundesgesetzblatt I, p. 2494) as amended by the Act of April 12, 1976 (Bundesgesetzblatt I, p. 965)

<sup>3)</sup> To the extent official documents are available.

following particular measures should be applied apart from the necessary design of the system (e.g. physical separation of the supply openings for redundant plant components):

1. Plant-related protective measures
  - a) for dangerous materials involving a short-term action
    - interruption of the supply of media (e.g. Isolation of ventilation systems),
    - change in the mode of operation (e.g. from supply air/exhaust air operation to recirculation)
  - b) for dangerous materials involving a long-term action
    - inspections including in-service inspections
    - cleaning.
2. Administrative/organizational protective measures
  - training of personnel,
  - protection of shift personnel including e.g. the availability of respirators, the establishment of areas with an autonomous treatment of media (e.g. air conditioning / regeneration).

Further measures may include:

- detectors for the respective dangerous materials in the supply openings, in the control room, on the power plant site and perhaps in the vicinity of endangered plant components,
- communications to the place where dangerous materials are handled and
- safety distances.

The present Interpretation does not consider the special aspects resulting from interference by third persons.

2. **Interpretation of Safety Criterion 8.5<sup>4)</sup>, "Heat Removal from the Containment"**  
- Does Safety Criterion 8.5 require a containment spray system? - (Status: May 17, 1979)

The removal of residual heat and storage heat from the containment as it is required in order to cope with incidents is effected by the residual heat removal systems. Therefore, the additional installation of a containment spray system will not be necessary, if it is demonstrated that the safety-related tasks laid down in Safety Criterion 8.5 will be reliably performed by the residual heat removal systems.

<sup>4)</sup> Safety Criterion 8.5 deals exclusively with heat removal from the containment. Therefore, the present Interpretation does not cover the question of an installation of a spray system to wash fission products out of the containment vessel atmosphere.