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SUPERVISION OF NUCLEAR FUEL TRANSPORTS

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APPENDIX 1 REGULATIONS CONCERNING VARIOUS TRANSPORTATION MODES

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PL-P.O.BOX 268
SF-00101 HELSINKI 10
FINLAND

Ydinturvallisuusosasto
Department of Nuclear Safety
Kalevankatu 44

Puh.-Tel.
(90) 616 71

Telex
122691 STUK-SF

STUK A101 1988 05

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1 GENERAL

In the transports of nuclear materials, the aim is to maintain a high level of safety due to the special properties of nuclear material. Safety is ensured, besides with transport packages, by planning and performing the transport with care. This guide concerns transports of fresh and spent nuclear fuel. The guide can also be applied to the transports of other nuclear materials.

Nuclear material transports are subject to the Atomic Energy Act, the Act on Radiation Protection and the Act on Nuclear Liability. Additionally, the stipulations given by various branches of administration concerning the different transportation modes are applied to transports of nuclear materials.

The general supervision principles concerning nuclear materials are explained in Guide YVL 6.1 "Licensing of Nuclear Fuel and Other Nuclear Materials". The Finnish Centre for Radiation and Nuclear Safety (STUK) supervises that the transports of nuclear fuel are performed in accordance with the stipulations of the transport permit and the accepted plans. Especially the dispatching, transport and receiving of spent nuclear fuel are subject to regular inspections by STUK. In case of an accident during a transport, STUK can send its inspectors and radiation measuring patrols to the site of the accident to perform measurements at the site and in the surroundings.

Transports of nuclear fuel may be performed only in packages approved by STUK with the exception of certain special cases. The approval procedure is presented in Guide YVL 6.4 "Supervision of Nuclear Fuel Transport Packages".

2 REGULATIONS REGARDING THE TRANSPORT

Licenses issued by the Ministry of Trade and Industry and defined by the Atomic Energy Act (356/57) and by the Act on Protection against Radiation (174/57) are required for transports of nuclear fuel. The authority supervising compliance with the license stipulations is STUK, which at the same time is the competent authority in regard to transports of radioactive materials. Further, an insurance or a guarantee referred to in the Act on Nuclear Liability (484/72) shall be obtained for the transport.

The stipulations, regulations and instructions based on the above acts as well as the regulations concerning the various transportation modes, /1-9/, have to be followed in the transport. The regulations concerning the transportation modes are in more detail listed in Appendix 1.

The various stipulations concerning the transportation modes of dangerous materials are based, in regard to nuclear materials and other radioactive materials, on the recommendations on the transport of radioactive materials given by the International Atomic Energy Agency (IAEA) /1/. If the transport and the transport package of nuclear materia meet the requirements of the IAEA transport recommendations, the requirements given in the regulations concerning the various transportation modes to ensure radiation and nuclear safety are also met. Because of this, the IAEA transport recommendations have been taken as the basis of this guide and they are considered as the minimum requirements for the approval of transports and transport packages of nuclear fuel. The definitions of the terms used in this guide can also be found in Reference 1, sections 1, 5 and 6.

3 APPROVAL PROCEDURE

The transport of nuclear fuel can be commenced after the receipt of an approval from STUK. Approval is applied

in writing to STL not later than three weeks before the planned date for the transport.

The following information is included in the application for the approval of the transport, where applicable:

a) consignor and consignee, their addresses and the power plant to which the fuel is supplied

b) a list of licenses necessary for the transport (atomic energy license, safety license, and special licenses for each transport) and of the insurance or guarantee (transport certificate) in accordance with the Act on Nuclear Liability

c) material to be transported, its quantity (weight and number of fuel bundles) and the number of the reload batch of the power plant unit as well as the original isotopic enrichment level

d) when a transport of spent nuclear fuel is concerned, the average burnup, residual heat and date of discharge of fuel from the core

e) identification mark of the approval certificate of the package, its category, transport index, fissile class and the allowable number of packages, as well as references to the transport plan, emergency plan and the plan for physical protection

f) radiation types, dose rate (on the surface of the package and at 1 m and 2 m distances from the package), surface contamination and total activity

g) transport events and the carrier(s) performing the transport

h) descriptions of exceptional arrangements

i) estimated time of transport and customs clearance

j) contact person of the applicant

k) date, name and address.

If the transport takes place from or to a foreign country (i.e. the material is imported or exported), the preliminary notice of the export or import, referred to in Guide YVL 6.11 "Reporting on Nuclear Materials", can be included in the application for approval. In that case the requirements concerning the contents and delivery time of the preliminary notice, presented in Guide YVL 6.11, shall be taken into account in the application.

For the transport, there shall be a transport plan, a plan for physical protection /9/ and an emergency plan, which can be a part of the transport plan or a separate report. In the application for the approval of transport, reference is made to STUK's decisions concerning the above plans or to documents separately delivered to STUK. The transport, emergency, and physical protection plans shall be submitted to STUK for approval not later than 2 months before the planned date for the transport.

The plans accepted by STUK and the regulations presented in paragraphs 520-554 of ref. 1 shall be followed in the transport. The transport vehicle and package shall be marked according to paragraphs 510-519 of ref. 1.

STUK shall be informed of the transport not later than 24 hours before the transport is begun. If no changes have been made to the date given in the application for approval of the transport, no separate preliminary notice is needed. STUK supervises transports by performing inspections to the extent it considers appropriate.

4 TRANSPORT PLAN

The transport plan is a document which is prepared for a transport of a certain type. The details concerning a single transport and justified deviations from the transport plan are presented in the application for the approval of a single transport. The transport plan made for a certain type of recurring transport will not include infromation, such as time schedules or names of transport personnel, which have little significance in regard to the safety of the transport and which are often changed. This kind of information is presented either in the application for the approval of a single transport or in the appendix of the transport plan. Changes in the contents of this appendix are submitted to STUK for information.

The plan shall deal with the following matters to the extent they are relevant to the transport in question:

4.1 General data

The following data shall be given

a) name and address of the applicant for approval, the consignor and the consignee

b) identification mark of the approval certificate and classification of the package (fissile class, estimated allowable number of packages, estimated transport index, and estimated category)

c) transportation mode (road, railway, water or air transport and transport route), the carrier performing the transport and possible stops (place, duration, and nature of storage)

d) special safety arrangements (e.g. speed limits, restrictions for other traffic, special equipment)

e) notification if the transport takes place as a full load

f) notification if the application concerns a transport with special arrangements.

4.2 Specifications for the package

The following information shall be presented of the package:

a) description of the packaging and the contents
b) weights of all packages included in the transport and other information that is significant to the handling of the packages
c) requirements concerning the way the package has to be attached to its transport base
d) description, if the physical or chemical properties of the material to be transported can change in normal transport conditions or in an accident situation
e) an estimate of the radiation dose that the material to be transported may cause to the transport personnel or the population in the environment during the transport.

4.3 Transport equipment

Transport equipment and material, including special devices and radiation protection equipment, shall be presented. Further, a description shall be given of the separate loading, unloading and transfer equipment, the approval procedure of which has been presented in section 5.

4.4 Emergency plan

An emergency plan, which describes the measures taken when getting prepared for emergency and disturbance conditions, shall be presented for the transports of spent fuel. The emergency plan shall include at least the following items:

- general arrangements of the transport, transportation hazards and possibilities of an accident
- description of emergency organizations
- alarm and communication systems
- preparations for limiting the consequences of an accident
- instructions for the transport personnel in case of an accident
- measures that are taken to protect and aid the transport personnel and the population in the environment
- description of the emergency equipment
- maintenance of preparedness (training and drills) and dissemination of information.

Because the person responsible for the transport shall take care of the safety arrangements in emergency and disturbance situations in co-operation with the rescue service authorities, the emergency plan shall be closely connected with the authorities' rescue service plans. The emergency plan accepted by STUK shall be delivered to the rescue service authorities for information. The emergency plan prepared for spent fuel transports can also be a separate document.

Provision for disturbance and accident situations shall also be made in the transports of fresh fuel. The transport personnel shall be informed of the measures to be taken in accident and incident situations.

4.5 Personnel

The following information shall be presented of the personnel:

- organizational units taking part in the planning, transport, loading, and unloading, their tasks and responsibilities

- training and drills arranged for the above personnel.

STUK shall be informed of the most important training occasions of the transport personnel.

4.6 Transports under special arrangements

If the transport or the transport package does not meet all the requirements set for them, the transport can in special cases be approved, provided that certain safety-enhancing measures are taken. In this case, the transport takes place under special arrangements and the following information, besides the information given in sections 4.1 - 4.5, shall be given (/1/, 819-820):

- reasons why the transport cannot be performed according to the requirements set above
- suggested measures enhancing safety
- any earlier licenses and approvals given by the authorities for similar special arrangements.

4.7 Instructions

The transport plan shall be supplemented at least with the following instructions:

- instructions on the measures taken by the consignor before the transport (/1/, 827-838)
- instructions on the use and handling of equipment, on potential inspections during the transport, and on special restrictions set for use and handling
- instructions on storage during the transport
- instructions on receiving/handing over the transport and on the documents to be exchanged and prepared in this connection
- instructions on maintenance and measurements to be performed during the transport

- instructions on special arrrangements meant to prevent water from entering the package or leaking out from it
- instructions on quality assurance.

5 HANDLING EQUIPMENT

The supervision of the separate unloading, transfer and loading equipment related to the transport consists of the following tasks in STUK:

- approval of pre-examination documents
- construction and commissioning inspections
- periodic inspections.

Where applicable, the supervision follows the guide on the handling and storage of nuclear fuel. If the applican has borrowed foreign unloading, transfer or loading equipment, he only needs to give a description of their construction, dimensioning, intention, application, and of the periodic inspections performed.

6 SHIPMENT APPROVAL CERTIFICATE

After inspecting and approving the transport plan, the emergency plan and the plan for physical protection, STUK approves the transport of nuclear fuel to be performed accoring to the application mentioned in section 3. STUK gives a shipment approval certificate in accordance with ref. 1, paragraphs 822-824, in cases where the package to be transported is of type B(M) or belongs to fissile class III and in cases where the transport requires special arrangements. For the transport of a package of fissile class II, STUK gives an approval decision. The transport of a package of fissile class I does not generally require an approval by STUK, unless it is separately demanded.

7 DOCUMENTS TO BE DELIVERED AFTER THE TRANSPORT

The party that is responsible for the transport shall inform STUK of the completion of the transport in writing within two days. In addition, STUK is informed of the receiving of the transport according to Guide YVL 6.11. If there have been deviations from the transport plan, the emergency plan or the plan for physical protection, a report on these deviations shall be prepared for STUK. A special report shall be prepared on accident and incident situations during the transport describing the reasons which led to the situation, its consequences, the measures taken during the situation and the planned further actions. The reports shall be delivered to STUK within two weeks after the transport.

8 REFERENCES

1 Regulations for the Safe Transport of Radioactive Materials, 1973 Revised Edition (As Amended) IAEA, Safety Series No 6, Vienna 1979.

2 Decision of the Ministry of Communications on the carriage of dangerous goods by road, 610/78.

3 Regulations concerning carriage of dangerous goods by rail (VAK), VR 2696/79, 1979, Finnish State Railways.

4 International Maritime Dangerous Goods Code, (IMDG-Co de), IMO, 1982.

5 The Safe Transport of Dangerous Goods by Air, ICAO, 1981.

6 Guide YVL 6.1 "Licensing of Nuclear Fuel and Other Nuclear Materials".

7 Guide YVL 6.4 "Supervision of Nuclear Fuel Transport Packages".

8 Guide YVL 6.7 "Quality Assurance for Nuclear Fuel".

9 Guide YVL 6.21 "Physical Protection of Nuclear Fuel Transports".

In the event of any differences in interpretation of this guide, the Finnish version shall take precedence over this translation.

REGULATIONS CONCERNING VARIOUS TRANSPORTATION MODES

The regulations concerning the various transportation modes are as follows:

a) Road transports

- Act on carriage of dangerous goods by road, 510/74 and amendment 346/79
- Decree on carriage of dangerous goods by road, 861/74 and amendment 28/79
- Decree on the enforcement of the European Agreement concerning the International Carriage of Dangerous Goods by Road, 289/79 (Enforcement of the ADR-agreement from 28.3.1979) and amendment 185/82
- Decision of the Ministry of Communications on the carriage of dangerous goods by road, 610/78 and amendments 344/79, 995/79, 218/82 and 935/83
- European Agreement concerning the International Carriage of Dangerous Goods by Road, ADR and Appendix A.6, Geneva

b) Railway transports

- Decree on railway transports 714/75
- Regulations concerning carriage of dangerous goods by rail (VAK), VR 2696/79, 1.10.1979, Finnish State Railways
- Act on the acceptance of certain regulations in the international conventions concerning carriage of passengers and luggage (CIV) and carriage of dangerous goods by rail (CIM), 147/75

- Decree on the enactment of the international conventions concerning carriage of passengers and luggage (CIV) and carriage of dangerous goods by rail (CIM), 148/75
- The International Convention concerning the Carriage of Dangerous Goods by Rail (CIM), Annex 1 (RID)
- Regulations concerning carriage of dangerous goods in the railway traffic in Finland and in the USSR, VR 4785/77, 1.7.1977, Finnish State Railways
- Regulations concerning safe carriage of spent nuclear fuel in the direct railway traffic from Finland to the USSR, 8.7.1981, Finnish State Railways

c) Sea transports

- Maritime Act 167/39
- Decree on transportation of dangerous goods on a seagoing vessel, 357/80
- Decision of the National Board of Navigation on transport of dangerous goods on a seagoing vessel 27.11.1980 (require that the IMDG-code of IMO (previously IMCO) is followed after 1.1.1981)
- The International Maritime Dangerous Goods Code (IMDG-code) including Annex 1 concerning packaging and Amendments 1-19
- Decision of the National Board of Navigation on transportation of dangerous goods on Ro/Ro-ships in restricted traffic in the Baltic, 1.10.1980

d) Air transports

- Aviation Act, 595/64
- Aviation Decree, 525/68
- The Safe Transport of Dangerous Goods by Air, Annex 18 to the Convention on International Civil Aviation (ICAO), applied since 1.1.1984.