INSTITUTE OF RADIATION PROTECTION

GUIDE YVL 1.5 REV 1

April 24, 1981 1 (16)
Translated May21, 1981

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

REPORTING NUCLEAR POWER PLANT OPERATION TO THE INSTITUTE OF RADIATION PROTECTION

CONTENTS

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

1. GENERAL

The reports that the Institute of Radiation Protection (IRP) expects to receive from the plant owners are part of the safety supervision of nuclear power plants.

A summary of the reports to be submitted to the IRP is presented in section 2 of this guide. More exact instructions relating to each report are given either in section 4 of this guide or in other YVL-guides referred to.

2. REPORTS SUBMITTED TO THE INSTITUTE OF RADIATION PROTECTION

2.1 Daily report

The daily report is prepared every day and it is sent to the IRP by telex before 10 a.m. on the next week day following the day covered by the report. Reports compiled during weekends and holidays may be sent on the following workday. The report shall be checked by the shift supervisor. In addition, separate reports are prepared on some of the events that are mentioned in the telex.

2.2 Special report

A special report is compiled on events that are important to the safety of the plant, plant personnel or environment.

The IRP is immediately notified of the event by telex/telecopy. In the case of a sudden and serious event, the IRP is notified without delay also by telephone in accordance with the alarm list included in the emergency plan. Any supplementary material relating to the event is submitted without delay to the IRP for information. The special report itself is sent to the IRP for approval not later than two weeks after the event.

2.3 Report on reactor trips

A report on reactor trips is compiled on all reactor trips. The IRP is notified of the event by telephone during the normal working hours and in writing in the next daily report, at the latest. Preliminary supplementary material is submitted to the IRP for information, when required. The actual report is submitted to the IRP for information not later than two weeks after the event.

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

2.4 Report on operating disturbances

A report on operating disturbances is compiled on notable forced power reductions, functions of the protective systems and disturbances affecting the operation of the primary or secondary circuit. The IRP is notified in connection with the daily report. Preliminary supplementary material is submitted to the IRP for information, when required. The actual report is submitted to the IRP for information not later than two weeks after the events.

2.5 Notification and report on pressure vessel damage

To fulfill the provisions in the 25th paragraph of Statute on Pressure Vessels 549/73, the supervisor or pressure vessel operation shall give a notification of damaged pressure vessels. The IRP is informed without delay of the detected damage by telex. A detailed report on the damage is submitted to the IRP, when required.

2.6 Monthly report

The report is submitted to the IRP for information not later than the 15th of the month following the month covered by the report.

2.7 Annual report

The annual report concerning the operation in the preceding calendar year is submitted to the IRP for information before the 1st of April of the following year.

2.8 Environmental radiation safety reports

The report comprising the results of the preceding calendar year is sent to the IRP for approval before the 1st of April of the following year. In addition, the results of the first six months of a year are reported before the 1st of October. The reports give radioactive releases, spreading data, dose calculations and the results of radiation monitoring based on environmental measurements. More exact instructions are given in Guide YVL 7.8.

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

2.9 Reports on personal radiation doses

The personal dose data are, as a rule, reported monthly for the central dose file administered by the Institute of Radiation Protection. As an exception to this rule, the external radiation doses are reported immediately after the employment of a worker has expired or a temporary worker has left his job. More exact instructions are given in Guide YVL 7.10. The doses received by IAEA inspectors are reported to the IRP in accordance with Guide YVL 6.11.

2.10 Reports on nuclear materials

For the accounting and control of nuclear materials, the following documents are submitted to the IRP

- accounting reports
- operational programmes and notices
- notifications related to the accounting and supervising procedures
- special reports concerning nuclear materials

More exact instructions are given in Guide YVL 6.11.

2.11 Report on the results of inservice inspections conducted in accordance with Guide YVL 3.8

The report on the results of inservice inspections for each inspection is submitted to the IRP for approval not later than three months after the inspections are completed. More exact intructions are given in Guide YVL 3.8.

2.12 Reports on outages and individual work performances

As concerns the supervision of outages, the IRP shall receive reports e.g. on the pursuancel of radiation protection measures during extensive outages and on inspections of fuel and control rods. In addition, a report on individual inspections or tests is given, if required. More exact instructions are given in Guides YVL 1.8, YVL 1.13 and YVL 6.1.

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

3. SUBMISSION OF REPORTS

The reports (not including reports sent by telex) are submitted to the IRP in accordance with Guide YVL 1.2. The reports are marked with a equential number according to their type. If the report is supplemented, the supplement is marked with the original number and a letter code running in alphabetical order.

4. INFORMATION GIVEN IN REPORTS

4.1 Daily Report

The report is submitted to the IRP by telex. A description of the events including their time, causes and consequences as well as an account of the measures that have been taken shall be given to the extent that they are known at the time of compiling the telex. It is also mentioned, whether a separate report like those listed in section 2 will be compiled of the event. The following items shall be included in the telex, where applicable:

a) General description

Operating conditions and average power during the 24 hours; changes in power or in operating conditions, their time and causes and power data; other significant actions, for example:

- changes in the power of the reactor or the generator exceeding 5 % of the rated power
- the reactor achieves criticality or it is placed in a shutdown
- the generator is synchronized with the grid or taken off-line

b) Operating disturbances, for example

- reactor trip
- forced power reduction of the reactor or the generator
- operation of the protective system

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

- serious disturbances in the pressure, temperature or flow of the primary or secondary circuit or in the water level of the reactor, pressurizer or steam generator

c) Defects and disconnection of components mentioned in the Technical Specifications

1) Defects that make the component inoperable
2) Removals of components for minor repairs, modifications or other unplanned actions
3) Planned removals in accordance with the programmes for preventive maintenance, testing or in-service inspection.

Removals from service in class 1) (defects) are also reported during outages, removals in the other classes are reported during outages only is the component in question must meet certain requirements during shutdown.

When a component or a systems is being tested, a notification of a defect of class 1) is given also when the component is inoperable in the first test (e.g. stuck valve) but operates as planned in a second test performed immediately afterwards.

The notifications in group c) shall disclose, among other things, the above-mentioned class (1, 2 or 3), component designation, provision in Technical Specifications, time when the component is removed from service and when it is placed back in service and the cause for the removal. The number of the defect report/work permit and the time when a defect of class 2) was detected are also given. If the component is still out of service when the reporting period is completed, the time of placing the component back in service and any relating supplementary information shall be given in a subsequent report.

d) Other notices, for example

- notice of fires and explosions which do not require a special report
- notice of detected or suspected flaws in fresh fuel

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

- notice of radioactive releases to the environment, if their weekly average exceeds 2 x guide release rate (see Guide YVL 7.1)
- notice of...noteworthy leaks which do not require a special report. The notice gives a description of the location of the leak, the amount that has leaked, content of radioactivity and effect of the leak on the radiation levels at the plant
- notice of impending outages (see Guide YVL 1.13)

4.2 Special report

A special report is compiled on a safety-related occurence, in other words, there prevails a situation which may possibly reduce the safety of the plant or a situation which endangers the safety of the plant personnel or the environment, or the provisions in the Technical Specifications have been violated.

In the following list, there are examples of occurrences which require a special report. Furthermore, a special report is compiled on those even more serious events which make it necessary to give a warning or an alarm to the off-site rescue organization.

a) The limit, given in the Technical Specifications, which secures the integrity of the fuel cladding or of the pressure boundary in the primary circuit is exceeded.

b) The automatic protective function has not started, although some parameter has exceeded the protective limit specified in the Technical Specifications, or the protective function has not been completed as planned.

c) An abrupt activity increase in the reactor coolant indicative of fuel rupture, an exceptional leakage or degradation of the primary circuit, or weakening of the reactor containment so as not to meet the integrity or strength requirements, has been observed.

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

d) The reactor criticality factor observed in the stationary condition has deviated more than one per cent from the value anticipated for this condition, or an unplanned.....criticality is detected in the reactor or outside the reactor.

e) It is observed that the plant is being operated or has been operated in a manner which is not in accordance with the Technical Specifications.

f) The power production of the plant must be interrupted due to a requirement in the Technical Specifications.

g) There is a defective component, an operational deficiency, a faulty process or electric coupling, a false direction or some other fault which would obsiously prevent the systems from working as planned in an accident analysis or in some other basis of the Technical Specifications.

h) There is a flaw in some safety analysis or in an analysis method or some other faulty basis for the Technical Specifications and there is reason to expect that the safety assessments for the plant operation no longer fully apply to some situations.

i) There is a factor not taken into account earlier which is endangering safety, and to enhance safety some repairs must be performed.

j) It is observed that a safety or pressure relief valve affecting the pressure in the primary or the secondary circuit does not function properly or at all.

k) An excptional natural event or some other outside hazard upon the plant causes a situation, where restriction of the power or some other protective action is considered necessary.

l) A safety hazard or a wilful attempt to damage the plant has been observed, or there is a serious deficiency in the safety arrangements.

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

m) Radioactive substances have exceptionally spread inside the plant with the result that the air or surface contamination or radiation dose rate has considerably increased in those areas.

n) A liquid or gas leakage has occurred inside tha plant causing a situation which endangers or may endanger the execution of operations important to safety, or considerable amounts of liquid or gas have exceptionally leaked inside the plant out of systems containing or handling radioactive substances.

o) A used fuel bundle has been damaged or might have been damaged during handling or it has been under threat due to some other abnormal event.

p) The radiation dose of a person has possibly exceeded the dose limit (see Guide YVL 7.10)

q) The releases of radioactive substances to the environment exceed the limit calling for measures by authorities (see Guide YVL 7.1)

r) Unaccounted-for loss of nuclear material has been detected in the nuclear material inventory, or there are other reasons to believe that some nuclear material has been lost.

s) There has been a fire or an explosion jeopardizing the operation of components or causing personal damage.

t) There is a total loss of off-site power for one minute at least.

The following information shall be given in the special report, where applicable:

- time of the event
- description of the event and its importance to safety from the point of view of the plant personnel and the environment
- causes and consequences of the event and its effects on plant operation
- operation deficiencies and faults in the operating directions

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

- measures that where taken to secure the safe condition of the plant
- inspections, repairs and modifications that were carried out
- measures that will be taken to prevent the recurrence of the event
- information on the amount, quality, origin and radionuclide content of the radioactive material that has been exceptionally released inside the plant or into the environment as well as information on the resulting air and surface contamination and how they are determined
- information on decontamination measures
- information on whether the event has caused fuel damage, radioactive releases to the environment, considerable radiation doses or personal damages
- treatment of the issue in the safety group and possible recommendations given by the group
- potential computer output data clarifying the event, its progress and consequences (alarm printer, past-history, core supervision report, etc) plotter graphs or other figures.

4.3 Report on reactor trips

A report on reactor trips is compiled on all reactor trips. The report shall comprise at least the following information

- time of occurence
- description of the occurence, its causes and consequences
- operation faults related to the occurence
- inspections, repairs and other actions carried out
- start-up after the trip and its bases
- alarm printer and past-history data as well as the necessary plotter graphs and the core supervision
- start-up decision.

4.4 Report on operating disturbances

A report on operating disturbances is compiled on notable disturbances which have led to a forced power reduction of the reactor or the generator, operation of the protective systems, or have af-

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

fected the pressure, temperature of flow of the primary or the secondary circuit or the water level of the reactor, pressurizer (PWR) or steam generator (PWR). The same information that is presented in the report on reactor trips is also presented in this report, where applicable. The IRP does not require a separate report on operating disturbances, if a corresponding description of the event is presented in connection with a special report or with report on reactor trips. Nor is it required if the purpose of the power reduction is to facilitate repairs and modifications.

4.5 Notification and report on pressure vessel damage

A notification of a damaged pressure vessel or auxiliary shall be given in the following cases:

- the pressure vessel is totally broken or it is detected that its condition does not conform with the construction plans (leaks through the construction material, collapse of supports, external blows degrading the structure, nonconformances requiring repair by welding, fault indications exceeding the acceptance limit which are detected in inservice inspections carried out in accordance with Guide YVL 3.8, etc)
- the vessel has been operated in an improper manner (exceeding operating parameters, etc)
- the safety valve os the vessel has not functioned as designed

The notification shall comprise the following information

- mode of observation (operating disturbance, inspection round, inservice inspection pursuant to Guide YVL 3.8, inservice inspection required by the Statute on Pressure Vessels)
- description of the damage
- preliminary plans for actions to be taken (extension of inspections other corresponding vessels or to the same vessel in the second plant unit, the mode of repairing the damage, etc).

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

A detailed report on the damage is submitted to the IRP when required.

4.6 Monthly report

The following information shall be given in the monthly report:

a) Operating data of the plant

- production diagram of thermal and electrical power
- thermal energy produced
- gross electrical energy generated
- net electrical energy generated
- number of hours the reactor was critical
- number of hours the reactor was on-line
- capacity factor figures (see annual report, section a)

b) Summary of power reductions (5 % or more) and outages

- time of occurence
- reactor and generator power before and after the power reduction
- cause and corrective actions
- length of time time when the plant was at reduced power
- loss in production of electricity caused by the power reduction

c) Burn-up data of fuel (average burn-up and its increase, the greatest assembly-wise burn-up)

d) Estimate of possible leakages in fuel cladding

e) A description of those defects and functional deficiencies, detected in components referred to in the Technical Specifications, that have prevented the operation of the system or redundancy involved as required in the Technical Specifications, wherefore the components are determined to beinoperable (see daily report, section c) 1.). The description shall include, among other things, a

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

representation of the detect or the functional deficiency, time and mode of observation, effect on the operability of the system, cause and corrective actions that have been taken including the times as well as an account of the possibility of a common fault. The descriptions may be elucidated by illustrations

f) A list of modifications made to components that are subject to the Technical Specifications or belong to Safety Classes 1 or 2. The list shall give the time and cause of the modification and the actions that have been taken

g) The amounts of controlled leakages and a description of exceptional leakage points

h) A description of the most important non-controlled leakages

i) The specific activities of the primary and secondary circuits

j) Releases of radioactive substances

k) The collective radiation dose received by persons.

4.7 Annual report

In addition to a general summary, the annual report shall comprise the following information:

a) Operating data of the plant

- thermal energy produced
- gross electrical energy generated
- net electrical energy generated
- number of hours the reactor was critical
- number of hours the generator was on-line
- energy capacity factor (the ratio between the net electrical energy generated and the energy which could be generated during a year with the planned net power)

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

- outage rate (the decrease of the capacity factor due to operation disturbances or forced power reductions)
- time capacity factor (the time of the year during which the plant has generated electricity
- production diagram of thermal and electrical power.

b) Inservice inspections of pressure vessels in accordance with Guide YVL 3.8

- list of inservice inspections
- account of the accomplishment of the inspection range during the inspection period.

c) Pressure and heat transients directed to different parts of the primary circuit and to other fatigue-loaded pressure vessels

- the number of those various pressure and heat transients which have been used as the design basis for parts of the primary circuit or for other fatigue loaded pressure vessels and the changes in temperature of pressure that are greater or faster than the transients assumed in the design. Furthermore, the results for the first six months of the year shall be reported before the 1st of October.

d) Use of the reactor and the fuel

- monthly measured extreme values for the parameters characterising the power distribution
- power changes (number of changes in each refuelling cycle)
- detected fuel damages
- refuelling
- quantity of used fuel in fuel storages
- delivery and removal of fuel

e) Monthly diagrams for the chemical and activity analyses of reactor water and fuel basin water

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

f) Storage of liquid wastes

- waste types in the storage and the volume, total activity and most important radionuclides of each type

g) Storage and transportation of solid wastes

- waste types in the storage and the volume, total activity and most important radionuclides of each type
- the types, volume and activies of the wastes removed from the plant site and the most important radionuclide contained in them; storage site and form

h) Releases

- a summary of the releases of radioactive substances and the radiation doses caused by them in the environment

i) Radiation dose data

- distribution of personal whole-body doses with a division of 5 mSv (cf. YVL 7.10)
- collective whole-body dose divided between persons under surveillance and persons who have receiced doses as well as the number of these persons
- collective whole-body dose of the following groups of workes, number of persons who have received doses, the highest personal whole-body dose and a division between own employees and outside employees
  - radiation protection personnel
  - operating personnel
  - service and maintenance personnel
    - insulators
    - electricians
    - instrument workers

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF

- machine maintenance personnel
- inservice inspectors
- others (e.g. fuel handlers, waste handlers. The group shall be specified.)

- operations which have caused a dose exceeding 0,02 manSv are reported. The operations are divided into cyclic or repeated operations (e.g. refuelling, steam generator maintenance, etc) and individual, unusual operations. The name or object of the operation, the collective dose, the highest individual dose, the number of workers and the duration of the work are given
- distribution of internal doses with a division of 5 mSv for those doses that exceed the recording limits for internal doses defined in Guide YVL 7.10, the operation that has caused the internal doses and the whole-body doses.

j) Changes in the permanent personnel of the plant.

A4 81-1115/4

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

Telephone
61 671

Telex
122691 STL - SF