

A Recommendation of the National Board for Atomic
Safety and Radiation Protection for the Appointment
of Nuclear Safety Control Officers for Research
Reactors

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A Recommendation of the National Board for Atomic Safety and Radiation Protection for the Appointment of Nuclear Safety Control Officers for Research Reactors

Abstract

The Ordinance on the Implementation of Atomic Safety and Radiation Protection of the GDR requires that the managers of plants where nuclear facilities are operated appoint Control Officers for the fields of radiation protection, nuclear safety, physical protection, and accounting for and control of nuclear material. The Control Officers are staff members of the operating organization but their appointment is subject to approval by the National Board and requires adequate qualification. The main task of the Control Officers as specialists is to give advice to the plant manager who retains responsibility for the safety of nuclear facilities, and to verify on his behalf that all requirements within their competence are met by the operating group. For this reason the Control Officer has to be absolutely independent of the head of the operating group. To enable the Control Officers to accomplish all necessary control activities and to guarantee independence from the head of the operating group, the plant manager has to establish adequate regulations of operation. As a pattern for such regulations the National Board has issued a Recommendation for the Appointment of Nuclear Safety Control Officers for Research Reactors, which provides a comprehensive survey of the requisite qualification features as well as the duties and rights of these Control Officers. This recommendation will be dealt with in the presentation.

1. INTRODUCTION

In the German Democratic Republic (GDR) control officers for radiation protection have been employed for research reactors for more than two decades /1/. The new Ordinance on the Implementation of Atomic Safety and Radiation Protection of the GDR /2/ requires that from now on the managers of plants where research reactors are operated also appoint control officers for all subfields of atomic safety (see Fig. 1). This allows for a development that has led to an increasing specialization in the various fields of atomic safety and radiation protection.

To ensure an efficient activity of control officers, the plant managers are to elaborate instructions providing both

the qualification requirements and the rights and duties of control officers. As a pattern for these instructions, the National Board for Atomic Safety and Radiation Protection (the National Board) has issued a Recommendation for the Appointment of Nuclear Safety Control Officers for Research Reactors /3/. This recommendation will be presented in more details below.

2. PRINCIPLES FOR THE WORK OF CONTROL OFFICERS AND QUALIFICATION REQUIREMENTS ON CONTROL OFFICERS FOR NUCLEAR SAFETY OF RESEARCH REACTORS

The control officers are appointed by the plant manager and should be directly subordinated to him. They must never be disciplinarily subordinated to the head of the research reactor operating group. They perform their control activities on behalf of the plant manager and are both responsible and accountable to him. The appointment of control officers restricts neither the plant manager's responsibility nor that of the heads of operating groups.

For each control officer, the spatial and material spheres of responsibility have to be clearly established and, along with his main tasks and rights, laid down in his employment contract. If a control officer performs his control activities as a part-time job, this will take precedence over all his other tasks in the plant.

The appointment of a control officer requires approval by the National Board. This approval will be granted if the mentioned principles are met and the required qualifications are acquired. In accordance with a guideline of the National Board /4/ the appointment of control officers for nuclear safety of research reactors depends on the following qualification requirements

- a university degree in relevant discipline;
- not less than 3 years' work with a research reactor;
- specific knowledge of the design, mode of operation and utilization of research reactors in their sphere of responsibility;
- knowledge of the legal and operational regulations for the implementation of atomic safety and radiation protection and of the provisions made in the license of the National Board, and
- a state certificate of qualifications.

Prerequisite for acquiring the state qualification certificate is the participation in special training courses conducted by the National Board as the national centre of further education in atomic safety and radiation protection. Major items of such training courses are:

- knowledge of the legal regulations and guidelines in the fields of atomic safety and radiation protection,
- fundamental knowledge of nuclear engineering, and
- special knowledge in the field of nuclear safety.

The state qualification certificate is granted by the National Board after successfully passing the examination. The control officers are bound to attend the retraining

courses of the National Board which run nearly every year.

3. RIGHTS AND DUTIES OF CONTROL OFFICERS FOR NUCLEAR SAFETY OF RESEARCH REACTORS

The main tasks of control officers consists in giving advice to the plant manager on all issues concerning the nuclear safety of research reactors and in supervising the heads of research reactor operating groups in the observance of their duties to ensure nuclear safety.

The controls have to be made regularly by the control officers in their respective spheres of responsibility. Type and extent of controls are to be laid down in a control plan.

To ensure effective control, each control officer has the right to

- enter all facilities and rooms of his sphere of responsibility at any time;
- demand information, assessments and reports associated with the nuclear safety of the research reactor from the head of the operating group or from members of operating personnel, and
- inspect all plant documents and records important to the research reactor's nuclear safety.

Each control officer has to control that the demands for ensuring nuclear safety provided in GDR legal regulations, state licences, guidelines of the National Board and plant instructions are observed. He has also to control that the measures provided for the occurrence of unusual events are taken.

Here it should be noted that, in accordance with the term usual in the GDR, an unusual event is understood to be every safety-relevant deviation from the intended operation or operational state. Unusual events are to be reported to the National Board. Depending on the urgency of notification, there are three stages of notification. All details of procedure in the case of unusual events have been regulated in a guideline of the National Board /5/. This guideline also contains the demand to consult, in cases of doubt, the control officers in establishing the appropriate notification stage.

Each control officer has to take part in operations relevant to the nuclear safety of research reactors in his sphere of responsibility and to evaluate the results. In particular, he has to be involved in

- checks of the limits and conditions of safe operation;
- critical experiments;
- training in nuclear accident prevention, and
- examinations of reactor operators.

Each control officer has to keep a control ledger where to enter all controls performed and their results, particularly detected deficiencies in ensuring nuclear safety and measures and deadlines set to correct these deficiencies.

Each control officer is bound to demand, from the head of the research reactor operating group, the correction of such deficiencies as, e.g., offences against safety-relevant provisions in legal regulations, licences, plant instructions or special requirements of the National Board. In every case it has to be checked whether the occurrence has to be considered as an unusual event in the sense of the guideline. Irrespective of the result of this check, the control officer has to lay down deadlines for correcting deficiencies and to communicate them to the head of the operating group. If these deadlines are not observed, the control officer has to inform the plant manager and the National Board.

In the case of imminent danger to persons, facilities or equipment the control officer has to bar rooms, facilities, equipment or experiments from further use unless this has already been done by the head of the operating group. If barring is not the most suitable measure, he has to demand immediate measures to restore nuclear safety to eliminate acute danger or to limit damage. In any case the plant manager and the National Board have to be informed without delay.

The control officers have to be involved in preparing changes of research reactors or in planning new nuclear facilities in their sphere of responsibility. Changes may concern the design or utilization of the research reactor as well as safety-relevant operation instructions.

In the GDR, it is a duty to classify changes of research reactors in two categories according to their relevance to nuclear safety. It generally holds that all facility changes requiring a change of limits and conditions of safe operation have to be submitted to the National Board for approval. All other changes are not subject to approval but have to be communicated to the National Board. The head of an operating group has to decide on whether a change is subject to approval or notification. Such a decision has to be reviewed by the control officer. In the case of changes subject to approval an application for change has to be submitted to the National Board together with a proposal for the required change of limits and conditions of safe operation. The proposal and the statement of reasons have also to be reviewed by the control officer. The results of review are summarized in a statement which is attached to the application for approval.

In periodic operation reports every head of an operating group has to account to the National Board for the safe operation of the reactor. In particular observance of established limits and conditions has to be proved. The deadlines for these reports and the exact specification of their content are laid down in the operation licence of every research reactor.

In addition to routine reports special reports to the National Board are necessary, particularly in the case of unusual events and fulfilment of conditions improved by the National Board. Any reporting to the National Board

requires review and assessment by the control officer.

In certain situations, say after major revisions, facility changes or unusual events, it can be necessary that, before start-up of the research reactor, the entire reactor or individual parts or systems are thoroughly checked. It depends on the result of this check, which is to be recorded in an acceptance protocol, whether the research reactor may be started up again. The recommendation of the National Board /3/ provides that control officers have to carry out acceptance tests after major revisions and unusual events of the lowest stage. Acceptance tests after safety-relevant facility changes and unusual events of the second stage can be made by control officers only if they have been entrusted with the job by the National Board. This decision will be made from case to case. Acceptance tests after an unusual event of the highest notification stage are in any case performed by the National Board.

Each control officer is bound to regularly inform the plant manager of his control results and of problems related to nuclear safety in his sphere of responsibility. To this effect, the control officer has to prepare control reports that are also submitted to the National Board for information. Furthermore each control officer is bound to submit, at the request of the National Board, assessments, expertises or comments on special safety problems in his area of control.

4. FIRST EXPERIENCE

The Ordinance on the Implementation of Atomic Safety and Radiation Protection of 11 October 1984 /2/ permits different forms of organization for appointing control officers for nuclear safety. The organizational structure can be adapted to individual plant features to that the necessary expenditure is kept low.

For small research reactors it is sufficient if the control activity is performed as a part-time job or if an officer carries out controls in several subsections of atomic safety and radiation protection simultaneously. These variants have been chosen for the small training reactors of the Dresden Technical University and the Zittau Engineering College.

For plants where several research reactors are operated, it is an advantage to additionally appoint a senior control officer for nuclear safety. He should supervise all measures that equally apply to the operation of several research reactors. A typical example are the measures for nuclear accident prevention. The appointment of a senior control officer enables the control officers for research reactors to participate themselves in the preparation of safety accounts without violating the prohibition of individual control. In such cases the demanded independent control is to be performed by the senior control officer. In this way the special knowledge of control officers can

In this way the special knowledge of control officers can be better utilized. This variant is used by the Central Institute of Nuclear Research of the Academy of Sciences of the GDR where three research reactors and a number of other nuclear facilities are operated.

On the whole, the first practical experience gained through the activity of control officers for nuclear safety at the five research reactors of the GDR allows to assess that an increased safety level has been attained. Of course, spectacular improvements could not be expected since, as early as before appointing control officers, the safety level of research reactors was high. The activity of control officers has improved the plant managers' insight into the issues of nuclear safety, so that these aspects are more allowed for in long-term planning. Furthermore it has led to a higher level in reporting to the National Board and in issuing applications for approval of facility changes. Thus the National Board was enabled to concentrate more than before on priorities of safety in connection with the national surveillance of research reactors.

5. REFERENCES

- /1/ Zweite Durchführungsbestimmung zur Verordnung über den Verkehr mit radioaktiven Präparaten - Maßnahmen des Strahlenschutzes beim Verkehr mit radioaktiven Präparaten - vom 30. Januar 1957 (GB1. I (1957) S. 109)
- /2/ Verordnung über die Gewährleistung von Atomsicherheit und Strahlenschutz vom 11. Oktober 1984 (GB1. I (1984) Nr. 30 S. 341)
- /3/ Rahmenvorgabe zur Erarbeitung von betrieblichen Regelungen über die Rechte und Pflichten der Kontrollbeauftragten für nukleare Sicherheit für Forschungsreaktoren
(Interne Mitteilung des SAAS, Berlin, April 1988)
- /4/ Richtlinie über die Anforderungen an die Qualifikation und über die Weiterbildung des Personals von Forschungsreaktoren zur Gewährleistung von Atomsicherheit und Strahlenschutz vom 3. Juni 1988
(Mitteilungen des SAAS 25 (1988) Nr. 6)
- /5/ Richtlinie zum Verhalten bei außergewöhnlichen Ereignissen bei der Anwendung der Atomenergie vom 29. Oktober 1987
(Mitteilungen des SAAS 25 (1988) Nr. 1)

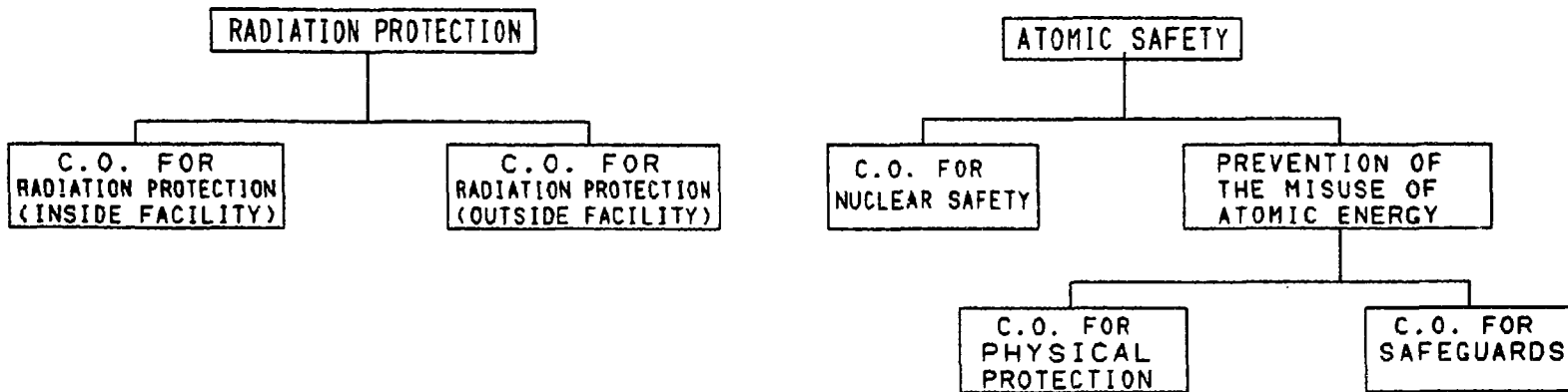


FIG. 1 CONTROL OFFICERS (C.O.) TO BE APPOINTED ACCORDING TO GDR REGULATIONS