



## If the worst should happen – central government work to prevent and manage nuclear accidents

A nuclear accident involving the release of radioactive substances may have very serious consequences for human life and health. It may also lead to disruption of the functionality of society as well as extensive economic and environmental consequences. A changed international situation in recent years has also increased the importance of protecting critical infrastructure. For these reasons, the Swedish National Audit Office (Swedish NAO) has examined whether the Government and the responsible agencies — the Swedish Civil Contingencies Agency (MSB), the Swedish Radiation Safety Authority (SSM) and the county administrative boards in the counties of Uppsala, Kalmar, Halland and Västmanland — work on the safety and security of nuclear activities satisfactorily. The audit has covered both the work of ensuring that nuclear accidents do not occur and the preparedness to deal with such events should they nevertheless occur, both in the acute phase and in the context of long-term recovery.

The audit was based on the following questions:

- Has the Government created sufficient preconditions for the work of the responsible agencies with regard to the safety and security of nuclear activities?
- Is the planning and preparation of the Government for its own role in the event of a nuclear accident satisfactory?
- Is the Swedish Civil Contingencies Agency's and the Swedish Radiation Safety Authority's supervision of the county administrative boards and the relevant licence holders, respectively, and support provided to the county administrative boards satisfactory?
- Is the planning and preparation of the responsible agencies for a possible nuclear accident satisfactory?

## Audit findings

The Swedish NAO notes that the safety and security work is largely carried out in an expedient manner. None the less, there are substantial elements of the work which cannot be assessed as satisfactory. The overall assessment by the Swedish NAO is therefore that the work of central government to prevent and manage nuclear accidents cannot be assessed as completely satisfactory. This means that it may be difficult to provide satisfactory and equivalent protection for human life and health, as well as property and the environment in Sweden, if a nuclear accident should nevertheless occur, and that it may also be difficult to safeguard the functionality of society.

- As regards *prevention*, the Swedish NAO considers that the supervision of nuclear facilities by SSM is deficient in terms of physical protection, information security and personnel security, and that central government resources to intervene in the event of antagonistic attacks vary.
- As regards developing and improving the *preparedness to manage the consequences* of a nuclear accident, this is made more difficult by the poor functioning of cooperation between MSB, SSM and the county administrative boards in the nuclear power counties, and the fact that MSB's supervision of the county administrative boards is infrequent and adds little to the activities of the county administrative boards.
- The Swedish NAO assesses that both the Government and the agencies audited are by and large well prepared to activate and staff their crisis organisations in *the acute phase* of managing a nuclear accident, and that they to a large extent have procedures and practices as well as the practical ability to fulfil their tasks.
- While problems of endurance may occur in several of the audited agencies, it is at the same time difficult to maintain long-term endurance in such an extreme event as a nuclear accident, with a reasonable allocation of resources.
- As far as the *long-term management* of a nuclear accident is concerned, there are several serious shortcomings as regards remediation, as already noted by the Swedish NAO as long ago as in 2007.

During the period of nuclear power, two very serious nuclear accidents have occurred: in Chernobyl in 1986 and Fukushima in 2011. The IAEA has investigated the causes and consequences of these accidents and has been able to draw a number of lessons. Among other things, it is important that there is a system for dealing with accidents that includes clearly defined roles and responsibilities, and that these are regularly practised in joint exercises. It is also necessary to have a prepared national strategy on the measures to be taken to restore the contaminated environment so that the affected parts of society can recover in the best way.

A further conclusion from the Fukushima accident relevant to this audit is that arrangements need to be in place to ensure that measures taken in response to a nuclear accident do more good than harm, and that a comprehensive approach is needed to achieve this balance. In a Swedish context, the Swedish NAO interprets this to mean that there must be a strong link between general emergency preparedness and nuclear energy preparedness, highlighting the importance of effective cooperation between MSB, SSM and county administrative boards.

It should be beyond doubt that it is important for Sweden to assimilate these lessons, and to ensure that they are put into practice. However, the Swedish NAO considers that central government has not done this fully, as this audit has revealed several shortcomings in preconditions, supervision and support, as well as the preparedness to decontaminate after radioactive fallout.

The main findings of the audit are described below.

### **The Government has not fully created sufficient preconditions**

The Swedish NAO considers that the Government has not fully created the necessary conditions for safety and security work in the field of nuclear activities. The division of responsibilities between MSB and SSM is partially unclear. The unclear division of responsibilities has negative consequences for the county administrative boards that play a key role in managing the emergency phase of a nuclear accident by leading the State's emergency services and that need support from both of these agencies. Another consequence, which is in part related to the unclear division of responsibilities between MSB and SSM, is that coordination, which is intended to facilitate preparedness for nuclear accidents, does not work as intended. This has contributed to the delay in development and therefore jeopardises the development of robust preparedness. The Swedish NAO therefore recommends that the Government clarify the division of responsibilities between MSB and SSM in coordinating contingency measures, and that it is appropriate that this is done in agency instruction. One additional element is that the agencies audited consider that there is no legal basis for their handling of iodine tablets, which may have negative consequences for future supply to the population. For that reason, the Swedish NAO recommends that the Government ensures that there is a legal basis for the continued handling of iodine tablets.

### **The Government has prepared its own role well**

With regard to the Government's own role in a nuclear accident, there is now a crisis management structure which is designed to cope with a crisis involving severe strain over a long period of time. There are also procedures and practices for the dissemination of information and coordination forums that enable effective crisis management, as well as mainly

appropriate infrastructure. This is a substantial improvement compared to the situation at the time of the Swedish NAO's previous audit of preparedness for nuclear accidents in 2007.

### **Too little supervision and support**

MSB supervises the county administrative boards and provides support to them, and SSM supervises licence holders and also provides support to the county administrative boards. The county administrative boards are of the opinion that MSB's support varies, while SSM's support has improved in recent years to a good level. As regards MSB's supervision of the county administrative boards' preparedness for nuclear accidents, the county administrative boards state that this is neither sufficiently frequent nor adequately followed up. In the case of SSM's supervision of physical protection, information security and personnel security at nuclear facilities, this is not exercised with sufficient frequency. This, combined with the inefficient collaboration on preparedness for nuclear accidents, is likely to hamper the development of good preparedness and restrict the regulators' insight into the activities examined. The Swedish NAO therefore recommends that MSB strengthens its supervision of the county administrative boards and resulting feedback, and that SSM enhances supervision of physical protection, information security and personnel security.

### **The agencies have not prepared everything**

The county administrative boards in the nuclear energy counties, MSB and SSM are well dimensioned to deal with a nuclear accident, but there may be problems with endurance. At the same time, from a resource and risk perspective, it is difficult to avoid endurance in a prolonged handling of a nuclear accident. In the case of an antagonistic attack on a nuclear facility, the capacity for dealing with this varies, as police resources for specific operations vary across the country. If a nuclear accident were to lead to contamination of large areas outside the nuclear facility, the remediation of those areas would be made difficult by the absence of a national remediation strategy and the fact that only one remediation exercise has taken place in the last five-year period. In addition, there is a lack of clarity between the audited agencies as to when remediation should be carried out. The Swedish NAO recommends that the Government instruct MSB, in collaboration with other actors concerned, to draw up a national strategy for remediation after a nuclear accident. In addition, the Swedish NAO recommends that MSB, SSM, as well as the county administrative boards in Uppsala, Kalmar and Halland, perform regular joint remediation exercises as part of existing nuclear preparedness training activities.