

Example of establishing the recycling of scrap metal as a waste management option within German regulations

Dipl.-Ing. Matthias Bodenstein, Dr. Johannes Delfs
TÜV NORD SysTec GmbH & Co. KG.

Dr. Oliver Karschnick
Ministry of Energy transition, Agriculture, the Environment and Rural Areas
of Schleswig-Holstein (MELUR)

Based on the German federal structure the state in which the nuclear power plant (NPP) is located is responsible for the nuclear licencing and supervising procedure which is regulated in the German Atomic Energy Act (AtG). The Ministry of Energy transition, Agriculture, the Environment and Rural Areas of Schleswig-Holstein (MELUR) is the competent authority for the federal state Schleswig-Holstein which hosts the nuclear power plants Brokdorf, Brunsbüttel and Krümmel as well as the research reactor Helmholtz-Zentrum Geesthacht, HZG (see Fig. 1).

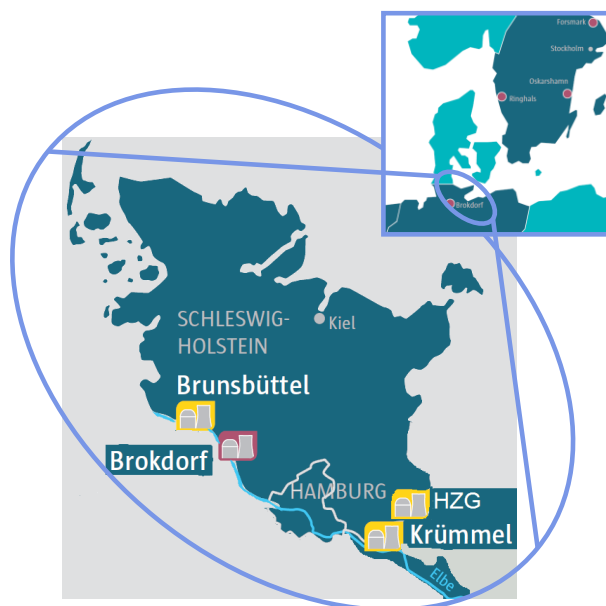


Figure 1: Nuclear facilities in Schleswig-Holstein, Germany. While the NPP Brokdorf (red mark) is still in operation, the NPPs Brunsbüttel and Krümmel as well as research reactor HZG (yellow mark) are intended for decommissioning. (Source: DAfF, 2014)

The authority in charge may consult experts in accordance with § 20 AtG. In the field of clearance the MELUR has chosen TÜV NORD Systec GmbH & Co KG by contract award. TÜV NORD is an expert organization whose members speak on their own behalf and act independently of all external influence.

The clearance of scrap metal for recycling is one option. It is subject to boundary conditions such as the conditioning procedure, the applicable regulations which have

to be considered and the requirements which need to be fulfilled. This applies in particular for European Commission's recommendations such as RP 89. The implementation of these recommendations into national law falls solely to the EU countries themselves and therefore a stricter interpretation could be possible. The requirements of the applicable regulation have an impact on the documentation, the sampling for evidence of the release capability as well as the implementation of the conditioning process itself.



Figure 2: Clearance according to § 29 StrlSchV in Schleswig-Holstein, Germany.

The clearance is regulated in the German radiation protection ordinance, § 29 *Strahlenschutzverordnung* (StrlSchV). According to these regulations the clearance process is an administrative act by the supervisory authority on the basis of a licence (see Fig. 2). The licensee shall submit a material specific confirmation and verification by the radiation protection officer that residual contamination is below particular clearance levels and the material conforms to all clearance conditions given in the licence or StrlSchV. Prior to the release from regulatory control the independent assessment by an authorized expert is required which provides the basis on which a final approval and/or additional control by the supervisory authority can be performed.

The supervisory authority may also allow a clearance in the scope of an external licence. In that case - of course - the different responsibilities and sovereignties need to remain untouched. The agreement with both supervisory authorities and comparable requirements on the clearance represent further preconditions. In addition, radioactive waste which follows from external treatment, also with the aim of clearance, needs to be taken back by the NPP because the licensee is responsible for waste originating from their material.

An example of establishing the release of metal scrap after licenced melting within German regulations is illustrated in Figure 3. Prior to the clearance process a relevant application of the licensee has to be submitted to MELUR. To assess whether the recycling can be performed, the individual steps of the conditioning process, from the declaration of the scrap metal up to the recycling according to RP 89, must be known. The processes should be governed by internal instructions of the melting facility and the NPP. Further requirements of the melting facility such as acceptance criteria for scrap metal are to be submitted so that their implementation is ensured. Furthermore, the licencing situation for the melting facility has to be known. Before approval of the clearance process the MELUR needs the documentation to ensure compliance with the requirements. The MELUR agrees on the respective method and on the documentation and determines the scope and depth of the accompanying inspections by independent experts.

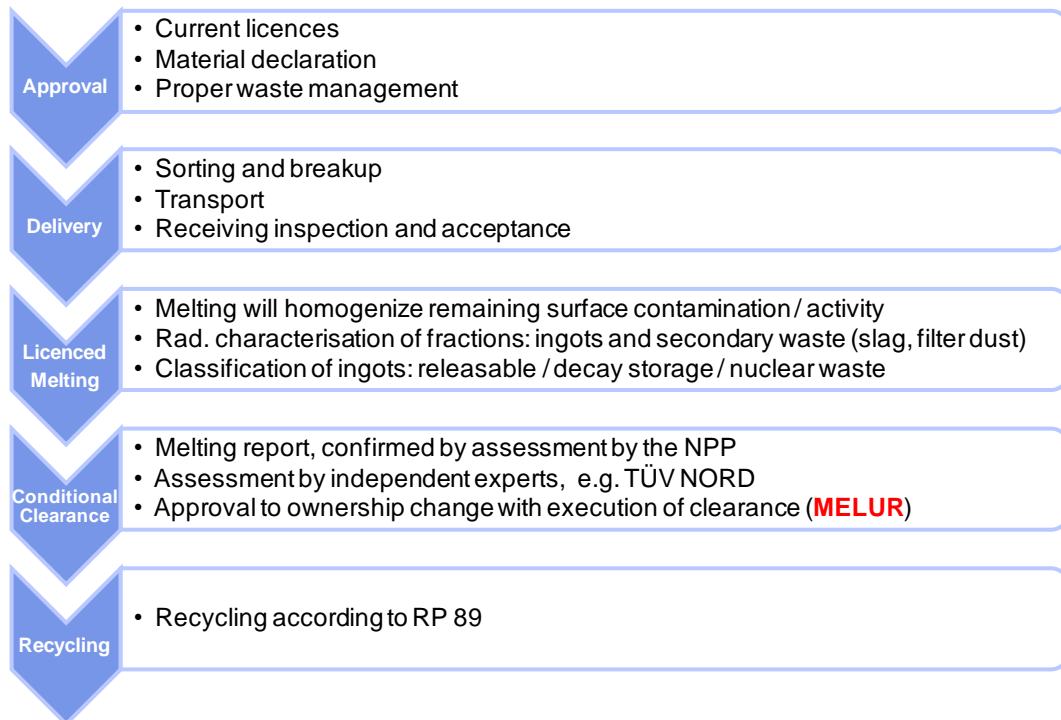


Figure 3: Example of establishing the release of metal scrap after licenced melting within German regulations.

The actual clearance step is combined with the necessary change of ownership to which MELUR has to give the agreement. The basis of this is a melting report provided by the melting facility which has firstly been confirmed by assessment by the NPP. Secondly an assessment by independent expert consulted by MELUR is necessary before MELUR can approve to a change of ownership with execution of the clearance. That procedure is recorded on an official form which is signed by the relevant parties.

Practical experiences in recent years regarding the above described process showed the need to define observable parameters that demonstrate full compliance with the process specifications. The mass- and activity flux between the NPP and the melting facility before the ownership has changed is needed to fulfil the § 70 StrlSchV concerning the bookkeeping. The weighing before and after the conditioning process can be done accurately with proper instrumentation and ensures the completion of all conditioning steps. A thorough understanding of methods and processes is mandatory to appoint these sensible parameters.

To summarize, the radiologically controlled melting and subsequent recycling is a waste management option for scrap metal. The treatment and the clearance of metal scrap in scope of an external licence are conceivable under some circumstances such as the comparability of regulatory requirements on clearance. The experience has shown that despite additional requirements and cultural peculiarities the recycling of metals in foreign EU member states can be applied in a practicable way.