Strål
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Swedish Radiation Safety Authority

Research

INCLUDE: Including (local) stakeholder participation in the regulatory mission — a future challenge

2025:02

Authors: Anne Bergmans, University of Antwerp, Antwerp
Meritxell Martell, Merience SCP, Barcelona

Strål säkerhets myndigheten
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SSM perspektiv

Bakgrund

Det primära fokus för SSM:s kommunikation med intressenter i samband med slutförvaring av använt kärnbränsle och kärnavfall har under flera år legat på formella samrådsprocesser kring den svenska kärnkraftsindustrins forsknings- och utvecklingsprogram samt SKB:s tillståndsansökningar enligt kärntekniklagen. Efter regeringens beslut om tillstånd är det aktuellt för myndigheten att överväga om nya former för dialog och samråd med intressenter är lämpliga i förhållande till uppförande och drift av anläggningarna. Detta är särskilt angeläget i förhållande till lokalbefolkningen, men avser även andra aktörer (myndigheter och icke-statliga organisationer) på regional och nationell nivå.

SSM:s lagstiftade roll när det gäller tillsynen av strålsäkerheten utgör ett viktigt ansvar på uppdrag av samhället, vilket inte kan delegeras till andra aktörer. Icke desto mindre kan det konstateras att, när berörda parter får tillfälle att ha insyn och påverkan i myndighetens arbete, möjliggörs ett så bra beslutsunderlag som möjligt. Myndigheten beställde därför detta forskningsprojekt i syfte att bättre förstå fördelarna och nackdelarna med olika typer av processer för intressentengagemang, för att stödja framtagandet av genomförbara förslag som omfattar både formella granskningsskeden och fortlöpande dialog med berörda parter.

Resultat

Forskningsprojektets resultat kombinerar reflektioner från intervjuer med en rad olika intressentgrupper med insikter från akademisk forskning om myndighetsrollen och de olika "stilar" med vilka tillsynsmyndigheter kan engagera med berörda parter. Rapporten lyfter fram ett antal tydliga förväntningar från svenska intressenter, i synnerhet en önskan om öppet engagemang och diskussion, som sträcker sig bortom att begära in skriftliga uttalanden och åsikter som en del av en formell samrådsprocess vid specifika steg i beslutsfattande. I detta avseende lyfter författarna särskilt fram konceptet med tillsynsmyndigheten som ombud – tillgänglig och kapabel att förstå och svara på frågor och problem som andra tar upp. Rapportens slutsatser understryker också vikten av dialog för att vara uppmärksam på nya frågor, så att engagemang framöver, när myndighetens prövningsprocess blir allt mer fokuserad på tekniska detaljer, inte bara ses som att "stänga ner" möjligheter till diskussion om frågor av intresse för intressenter.

Relevans

Det var aldrig meningen att projektet skulle resultera i en lista med specifika rekommendationer för det tillvägagångssätt som SSM ska ta framöver. Detta erkänns av författarna som en fråga för SSM:s policy, med hänsyn till bredare institutionella krav och begränsningar. Utifrån den information som erhållits och syntetiserats i rapporten finns det dock flera viktiga frågor identifierade som bör tas upp i den fortsatta utvecklingen av SSM:s policy och strategi för engagemang. Även om sådana överväganden i första hand behandlas mot bakgrund av slutförvaret för använt kärnbränsle, torde sådana överväganden vara relevanta för utvecklingen av en konsekvent policy för intressentengagemang för andra typer av kärnkraftsanläggningar i Sverige.

Behov av vidare forskning

Inga särskilda behov av ytterligare forskning i detta område identifieras i detta skede. Detta utesluter dock inte det potentiella behovet av stöd vid vidareutveckling och implementering av SSM:s policy och strategi för intressentengagemang.

Projektinformation

Kontaktperson SSM: Michael Egan
Referens: SSM2021-938 / 4530049

SSM perspective

Background
The primary focus of SSM's communication with stakeholders in relation to the disposal of spent nuclear fuel and nuclear waste has for several years been on formal consultation processes surrounding the Swedish nuclear power industry's research and development programme as well as SKB's licence applications under the Nuclear Activities Act. Following licensing by the Swedish Government, it is relevant for the Authority to consider whether new forms of dialogue and consultation with stakeholders are appropriate in relation to the construction and operation of the facilities. This is particularly relevant in relation to the local population, but also concern to other actors (authorities and non-governmental organisations) at a regional and national level.

SSM's statutory role regarding the supervision of radiation safety constitutes an important responsibility on behalf of society, which cannot be delegated to other actors. Nevertheless, when those concerned are given the opportunity to gain insight into and have influence on the Authority's work, this facilitates the best possible basis for decision-making. The Authority therefore commissioned this research project with the aim of better understanding the advantages and disadvantages of different types of stakeholder engagement processes, to support the development of practicable proposals to encompass both formal review stages and ongoing dialogue with affected parties.

Results
The results of the research project combine reflections obtained from interviews with a range of different stakeholder groups with insights gained from academic research into the regulatory role and the different "styles" with which regulators may engage with concerned parties. The report highlights a number of clear expectations from Swedish stakeholders, notably a desire for open engagement and discussion, extending beyond soliciting written statements and opinions as part of a formal consultation process at specific steps in regulatory decision making. In this respect, the authors highlight in particular the concept of the regulator as an intermediary – accessible and capable of understanding and responding to questions and concerns raised by others. The report's conclusions also underline the importance of dialogue for being attentive to emerging issues, so that engagement going forward, as the regulatory process becomes increasingly focused on technical detail, is not simply seen as "closing down" opportunities for discussion on matters of interest and concern.

Relevance
It was never the intention that the project should result in a list of specific recommendations for the approach to be taken by SSM going forward. This is recognised by the authors as being a matter for SSM policy, taking into account wider institutional requirements and constraints. However, on the basis of the information gained and synthesised in the report, there are several important issues identified that should be addressed in the further development of SSM's policy and strategy for engagement. Although addressed primarily against the background of the final disposal of spent fuel, such considerations are likely to be relevant to the development of a consistent policy on stakeholder engagement for other types of nuclear facility in Sweden.

Need for further research
No specific needs for further research are identified at this stage. However, this does not exclude the potential need for support in the further development and implementation of SSM's policy and strategy for stakeholder engagement.

Project information
Contact person SSM: Michael Egan
Reference: SSM2021-938 / 4530049

Abstract

This report presents the results of an applied research project commissioned by the Swedish Radiation Safety Authority (SSM), with the aim of providing insights to guide SSM's strategy for stakeholder engagement as part of its regulatory mission, in particular following initial licensing of facilities for the final disposal of nuclear waste and spent fuel. The need for such insights stems from the fact that, unlike SSM's preparation of applications prior to a government licensing decision under the Act on Nuclear Activities, there are no formal legal requirements that establish expectations for how SSM should engage with stakeholders during its subsequent review and oversight of the construction and operation of such facilities.

A central element of the work conducted during the project was a series of interviews aimed at obtaining reflections from a range of different stakeholder groups with regard to expectations and experience of interactions with SSM. These interviews highlighted, among other things, a desire for open engagement and discussion, reflecting a level of ambition that extends beyond simply soliciting written statements and opinions as part of a formal consultation process at specific formal stages of regulatory decision making. Coupled with the outcomes of the interviews, the study reflects on academic insights into the regulatory role as well as the different "styles" with which regulators may engage with concerned parties. In particular, the report draws out the importance the regulator being accessible and responsive to the stakeholders' questions and concerns. The report's conclusions also underline the importance of dialogue as a tool for ensuring that SSM remains attentive to emerging issues, so that – as projects move forward and the regulatory process becomes increasingly focused on technical detail – opportunities for discussion on wider matters of interest and concern are not closed down.

In making final recommendations from the study, the authors underline that regulatory excellence requires more than technical and legal competence, but also the capacity to build trust from openness, empathy and humility. SSM needs to make clear for itself the extent to which it can (both legally and practically) meet stakeholders' expectations, and then ensure that its organisational structure and competences are appropriately tailored to addressing such needs. The Authority's guiding strategy for stakeholder engagement in this area should be clearly communicated both internally and externally.

Sammanfattning

Denna rapport presenterar resultaten av ett tillämpat forskningsprojekt på uppdrag av Strålsäkerhetsmyndigheten (SSM), i syfte att ge insikter som vägleder SSM:s strategi för intressentengagemang som en del av dess regulatoriska uppdrag, i synnerhet efter initial licensiering av anläggningar för slutförvaring av kärnavfall och använt kärnbränsle. Behovet av sådana insikter härrör från det faktum att det, till skillnad från SSM:s beredning av ansökningar inför ett regeringsbeslut om tillstånd enligt kärntekniklagen, inte finns några formella lagkrav som fastställer förväntningar på hur SSM ska samarbeta med intressenter under dess efterföljande granskning och tillsyn av byggandet och driften av sådana anläggningar.

En central del av det arbete som genomfördes under projektet var en serie intervjuer som syftade till att få in reflektioner från en rad olika intressentgrupper när det gäller förväntningar och erfarenheter av interaktioner med SSM. Dessa intervjuer lyfte bland annat fram en önskan om öppet engagemang och diskussion, vilket speglar en ambitionsnivå som går utöver att bara begära skriftliga uttalanden och synpunkter som en del av en formell samrådsprocess i specifika formella skeden av myndighetens beslutsfattande. Tillsammans med resultaten av intervjuerna reflekterar studien över akademiska insikter om den reglerande rollen samt de olika "stilar" med vilka tillsynsmyndigheter kan samarbeta med berörda parter. Rapporten framhåller särskilt vikten av att tillsynsmyndigheten är tillgänglig och lyhörd för intressenternas frågor och problem. Rapportens slutsatser understryker också vikten av dialog som ett verktyg för att säkerställa att SSM förblir uppmärksam på nya frågor, så att – när projekten framskrider och regleringsprocessen blir alltmer fokuserad på tekniska detaljer – möjligheter till diskussion om bredare frågor av intresse inte stängs.

När de lämnar slutliga rekommendationer från studien betonar författarna att excellens i myndighetsutövande kräver inte bara teknisk och juridisk kompetens, men också förmågan att bygga förtroende utifrån öppenhet, empati och ödmjukhet. SSM måste för sig själv klargöra i vilken utsträckning den (både juridiskt och praktiskt) kan uppfylla intressenternas förväntningar och sedan säkerställa att dess organisationsstruktur och kompetens är lämpligt anpassad för att möta sådana behov. Myndighetens vägledande strategi för intressentengagemang på detta område bör tydligt kommuniceras både internt och externt.

Content

List of Abbreviations

AFCN-FANC: *Agence Féderale de Contrôle Nucléaire - Federaal Agentschap voor Nucleaire Controle* - Belgian Federal Agency for Nuclear Control

ANCCLI: *Association Nationale des Comités et Commissions Locales d'Information* - French Association of Local Information Committees (typically around nuclear facilities)

ANDRA: *Agence Nationale pour la gestion des Déchets Radioactifs* - French National Waste Management Agency

ASN: *Autorité de Sûreté Nucléaire* - French Nuclear Safety Authority

CLAB: *Centralt mellanlager för använt kärnbränsle* - Central Interim Storage Facility for Spent Nuclear Fuel at Simpevarp (Oskarshamn - Sweden)

CLI(S): *Comité/Commission Local d'Information (et de Suivi)* –Local committee in area with nuclear facilities in France

Clink: future name for the CLAB facility with adjacent encapsulation plant (Sweden)

CNSC: Canadian Nuclear Safety Commission

KBS-3 method: technology for nuclear waste disposal developed by SKB (Sweden); short for *kärnbränslesäkerhet* - nuclear fuel safety

KSO: *Kärnkraftskommunernas samarbetsorgan* - Swedish Association of Municipalities with Nuclear Facilities

NEA: Nuclear Energy Agency – operates within the framework of the OECD (Organisation for Economic Cooperation and Development)

NGOs: Non-Governmental Organisations

ONR: Office for Nuclear Regulation in the United Kingdom (UK)

RD&D: Research Development and Demonstration

SFR: *Slutförvar För Radioaktivt avfall* - Repository for Shortlived Radioactive Waste at Forsmark (Östhammar - Sweden)

SKB: *Svensk Kärnbränslehantering AB* - Swedish Nuclear Fuel and Waste Management Company

SKI: *Statens kärnkraftinspektion* - Swedish Nuclear Power Inspectorate (1974 – 2008)

SMRs: Small Modular Reactors

SSI: *Statens strålskyddsinstitut* - Swedish Radiation Protection Authority (1965 – 2008)

SSM: *Strålsakerhetsmyndigheten* - Swedish Radiation Safety Authority

STUK: *Säteilyturvakeskus* - Finish Radiation and Nuclear Safety Authority

1. Introduction

Only if the people working in a regulatory authority are committed to doing their utmost to deliver public value, and to learning and improving in their ability to deliver that value through respectful engagement with others, can a regulator hope to achieve true excellence." (Coglianese 2020: 10)

This report presents the results of the INCLUDE project, an applied research project, commissioned by the Swedish Radiation Safety Authority (SSM). The acronym INCLUDE stands for "Including (local) stakeholder participation in the regulatory mission – a future challenge". The project was set up as a qualitative analysis of concerns, needs and expectations regarding dialogue and consultation of various Swedish stakeholders in relation to the construction and operation of facilities related to the final disposal of the nation's nuclear waste and spent nuclear fuel. Its ultimate goal was to provide SSM with useful insights and possible ways forward for developing an appropriate engagement strategy in a post-approval situation (i.e. the process after the Government's decision to grant a licence). The study was conducted by the authors of this report, Prof. Dr. Anne Bergmans (University of Antwerp, Belgium) and Dr. Meritxell Martell (Merience SCP, Spain), with support from Dr. António Pereira (Uniquanta, Sweden) who collected relevant policy and legal documents and followed up the ongoing licensing process as it unfolded during the course of the study.

Experience (both in Sweden and elsewhere) has shown that communication and consultation processes with stakeholders are pivotal in contributing to a shared understanding of the problem and to define and implement a solution that is considered acceptably safe, fair and just by most, if not all key actors. Therefore, SSM plans to develop new approaches of governance, and consider its position as regulator in a "post-licensing" phase, during the construction and operation of the planned facilities for final disposal of nuclear waste and spent nuclear fuel, vis-à-vis various concerned stakeholders, and the municipalities of Östhammar and Oskarshamn in particular. The consultation process in relation to the development of the KBS-3 method for disposal of high-level nuclear waste, and the site selection and examination of the licence application for a dedicated disposal facility has raised expectations from the host municipality, but also from other concerned actors, for a continued dialogue, not only with the implementer, but also with the regulator.

For that purpose, SSM wanted to *"understand the advantages and disadvantages of different types of consultation processes in order to be able to develop reasonable proposals that include both formal review stages and ongoing contacts with affected parties"* (SSM2021-938). Important in that respect is to strike an appropriate balance between democratic ideals and stakeholder expectations on the one hand, and practical and legal considerations and constraints on the other hand, without compromising safety and radiation protection.

Therefore, the main research question to be addressed in this project was: *"How can an effective ongoing dialogue be created with the host municipality and other interested parties in relation to the Authority's follow-up and supervision activities in the future?"*

The following questions, also put forward in the call (SSM2021-938), served as guiding sub-questions throughout the research activity:

a. What are the predominant democratic considerations that affect the breadth and depth of SSM's consultations on issues relating to the construction, long-term operation and final closure of a geological repository after licensing?

b. What practical and legal constraints may affect the extent to which the Authority engages in consultation with stakeholders?

c. What forms of consultation process can be used in connection with different types of issues and with different groups of stakeholders, and how can the process best be formulated to establish reasonable expectations among participants?

d. Does formal consultation made in connection with prescribed formal decision stage stake place most effectively based on the licence-holder's submission or on a draft decision by the Authority?

In what follows we first provide a description of the methodology deployed for this research (Chapter 2) and a short explanation of how we understand the context and course of prior events to colour the positions taken by our respondents (Chapter 3). Then we report on the key messages received during the interviews (Chapter 4): in a first section the focus is on the views and expectations of Swedish stakeholders; a second section reports on the experiences shared by other regulators. Finally, we link these findings to insights derived from literature in order to indicate the potential and possible pathways for including (local) stakeholder participation in the regulatory mission (Chapter 5). We summarise what we consider the most important conclusions in the final chapter of this report (Chapter 6).

For the sake of clarity:

- Given that according to Swedish law spent nuclear fuel is not considered as waste until placed in a repository, when referring in the report to 'nuclear waste', 'nuclear waste management', 'nuclear waste disposal', etc. this should be understood to include spent nuclear fuel, unless explicitly indicated otherwise.

- Throughout this report, we have used the terms 'repository', 'repository facility' or 'disposal facility' when referring to the final resting place of nuclear waste. We considered this to be the most common terminology used internationally.

- The situation after the Swedish Government granted the licence under the Act on Nuclear Activities, will be referred to as the 'stepwise authorisation process'. This may not to be an exact translation of *"stegvis prövning"*, as it is described in the government's conditions (Kärnavfallsrådet 2022a), and which emphasis more the aspect of examination. However, the term (stepwise) authorisation is more commonly used in international texts, such as those of the IAEA, referring to a variety of situations whereby formal approval stages must be passed prior to full implementation. Therefore, we choose to apply it also in this context.

2. Methodology

For this research project, a combination of desk research and field work was deployed. The desk research included a review of scientific literature and a quick scan of relevant policy documents and legislation. The results of this desk research are not reported separately in this report, but are used to link field work findings to recommendations for including stakeholder participation in the regulatory mission. Perspectives of various stakeholders were collected through small group discussions and in-depth interviews, all of which were conducted online. Given the composition of the research-team (no legal experts or native Swedish speakers involved), input regarding possible legal constraints (sub-question b) was mainly gathered though interviews.

Both individual and group interviews were conducted with representatives from the Swedish Association of Municipalities with Nuclear Facilities (KSO), national and regional NGOs and concerned authorities, members of the (now former) Swedish National Council for Nuclear Waste (*Kärnavfallsrådet*), Swedish academic researchers from various disciplines studying specific aspects related to nuclear waste management, representatives of the implementer, *Svensk Kärnbränslehantering AB* (SKB), as well as SSM staff. Furthermore, interviews were conducted with staff from regulatory homologues in Belgium, Canada, Finland and France. In total, input was collected from 43 respondents, comprising in total 14 online interview sessions. A concluding online workshop was attended by 31 people (24 from outside SSM), together representing all Swedish actors interviewed in the course of this study.

Both individual and group interviews were semi-structured, following a similar protocol, whereby the discussion topics were slightly adapted or rephrased, depending on the type of respondents. The general protocol for Swedish stakeholders is included in this report as Annex 1. The issues discussed with other regulators can be found in Annex 2. All interviews were recorded and subsequently transcribed. The recordings were stored on a secured server at UAntwerpen, and will be deleted upon final delivery of this report. Analysis of the transcripts was performed on group level, that is positions taken within the general stakeholder categories listed above. For privacy reasons, individual respondents' names will not be disclosed. Therefore, transcripts and analytical notes will not be shared beyond the research team, as they may include references to individual respondents. In this report, we present overall findings, general tendencies, and striking differences (in case of occurrence) between stakeholder groups. To illustrate more clearly some of these findings, we have opted for paraphrasing similar remarks from different respondents, rather than quoting individual statements. All respondents were invited to provide feedback on a draft version of Chapter 4 which reports on the interviews.

The bulk of the research was conducted between November 2021 and September 2022. An online workshop to present main findings and collect feedback was organised on September 15th 2022. The last interviews took place in December 2022. Due to unforeseen circumstances, the completion of this concluding report had to be postponed until the summer of 2024.

3. Setting the Scene

With this introductory chapter, the researchers do not aim to provide a detailed historic overview or full description of the situation as was at the time the research took place. It serves to show how they understand the course of prior events to colour positions taken by various actors in relation to the role of SSM and their expectations regarding engagement activities in a "post-licensing" phase for the KBS-3 repository.

The final disposal programme for Sweden's nuclear waste and spent nuclear fuel has a long, and somewhat loaded history. This long-term endeavour started officially in the seventies with the proposition of a law stipulating an *"absolutely safe"* handling of the wastes produced as a condition to load new reactors with fuel (*Villkorslagen* or 'Stipulation Act' – SFS 1977:140). Whereas the act suggested a reconciliation of the divide between pro- and anti-nuclear forces in Sweden through an agreement on the importance of high safety standards for nuclear waste management, it would seem to have led to an even stronger polarisation. Opponents interpreted these requirements as setting unachievable goals for nuclear power, while pro-nuclear parties assessed the standards as attainable (Sundqvist 2002). In order to meet this legal requirement, the nuclear industry founded the Swedish Nuclear Fuel and Waste Management Company (SKB), with the core purpose of conducting R&D. Within a year of the Stipulation Act coming into force, the multi-barrier KBS system was presented as a technological solution to the waste problem, i.e. as *"absolutely safe"* (Sundqvist 2002, 79). But how to prove a technology is absolutely safe? From both a technical and legal perspective, the removal of the term 'absolute' from the legislation appears self-evident and unavoidable. With the introduction of the Act on Nuclear Activities (*Lag om kärnteknisk verksamhet* - SFS 1984:3) in 1984 - replacing the Stipulation Act, and still valid today - the objective shifted to *"safely handle and dispose of the radioactive waste"*. As a result, conflicts about energy futures were transformed into discussions about believing or not believing in the safe disposal of nuclear waste and in a particular technology to achieve that goal. Any attempt to address the waste problem was subsequently portrayed as either a bad excuse or a convincing argument for continuing or returning to nuclear energy production. Either way, the question of final disposal of nuclear waste thus became in the view of many actors more strongly linked to the (possible) future of nuclear energy than to its past.

This 'Mexican stand-off' situation and rendering of an inherently political choice into a technical discussion is not unique to Sweden. However, the combination of a political decision linking the future of nuclear energy to the technically safe handling of the waste on the one hand, with the responsibility for it and burden of proof in the hands of the industry on the other hand, is a relatively unique situation. One that has resulted in a particular dynamic with regard to the search for a 'final' solution for the country's nuclear waste. And one that has its bearing on views and expectations of different stakeholders concerning their interactions with the regulatory authorities.

At the time we conducted our research activity, the Swedish nuclear waste management programme was somewhat at a crossroads. When we started out in the autumn of 2021, an extension of SFR, the repository for short-lived radioactive waste (already in operation in Forsmark - Östhammar), and the planned KBS-3 repository at the same location, were still subject to licensing decisions expected to be taken by the Swedish government in the near future. The KBS-3 facility has been clearly framed as the final repository for the spent nuclear fuel produced in the past and by the existing Swedish nuclear reactors, estimated

at about 12 000 tons (Kärnavfallsrådet 2022b). The Clink facility (the planned encapsulation plant next to the interim storage facility for high level radioactive waste (CLAB) at Oskarshamn) was also waiting for a governmental decision within the same licensing process for KBS-3.

Those facilities are indivisible parts of what can be characterised as a unique megaproject (Lethonen, Joly, and Aparicio 2016) in Sweden, the implementation of which will involve in a near future more than 19 billion Swedish crowns and will take more than a half-century to be completed.
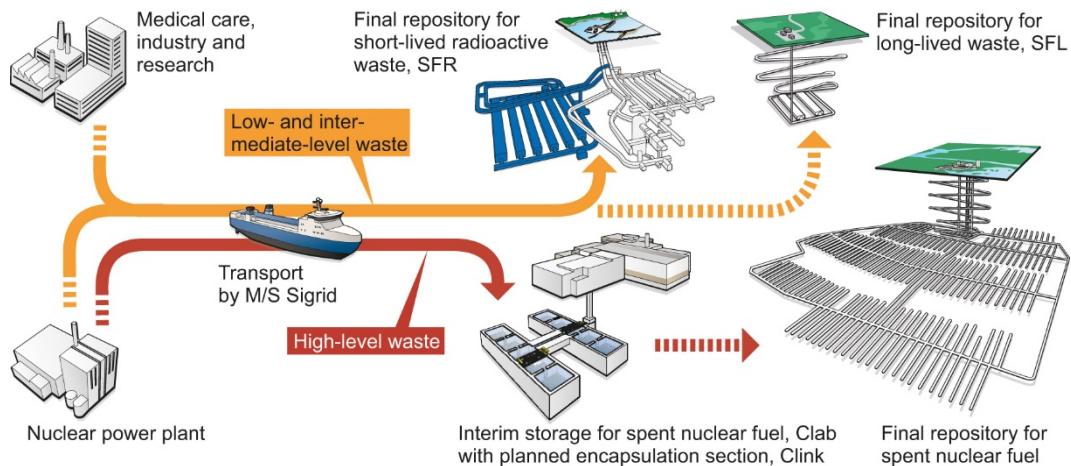

Figure 1: The Swedish Nuclear Waste Management System (source: The Swedish System - SKB.com)

By the time we conducted the first two group interviews in January 2022, the government had decided to approve the SFR extension, and the decision to approve the KBS-3 repository followed later that month. Interviews continued during a crucial and very visible stage in the licensing process, as further hearings in view of setting licence conditions under the Environmental Code were taking place in the Land and Environment Court. In April 2022 appeals against the government decision from the environmental movement were brought before the Supreme Administrative Court. The court's ruling that the decision had been taken in accordance with legal rules and procedures followed in May 2023, well after the last interviews had been conducted. On the one hand this made the topic of discussion being top of mind for all key actors, but on the other hand, most were quite occupied, or preferred awaiting a next step before taking the time for an interview. Therefore, it took some months before all interviews were conducted. At least two other issues remained "in flux" during this period, and coloured the mind-set of some of the respondents. One was the question of the funding for the municipalities and NGOs to participate in the siting and licensing process; the other the decision by Government in July 2022 not to further extend *Kärnavfallsrådet*'s mandate. Both were to a greater or lesser extent discussed depending on when the interviews were planned.

4. Findings from the interviews

Here we report on the key messages received during the interviews. When respondents referred us to published material, documents or websites, we have included those in our analyses. In a first section we discuss the results from the interviews with Swedish stakeholders. The second section is dedicated to the experiences shared by other regulators.

Stakeholder Views and Expectations

If there is any single common message to be taken from the interviews taken as a whole, it is that all respondents considered **engagement with various stakeholders an explicit role** for a regulator. Nevertheless, expectations differ between, and also within, stakeholder groups.

Great Expectations - Some Concerns

Most respondents see the role of the regulator as an independent, competent authority, in touch with the latest developments relating to science and technology (Research Development and Demonstration - RD&D) in its field, capable of assessing nuclear safety on behalf of society, but not irrespective of society. Several stressed a need for a regulator to be *"in touch with society"* and *"attentive to stakeholder concerns"*. Therefore, liaising with various concerned parties on a regular basis was seen as essential by just about all respondents.

As a flipside to these high general expectations regarding stakeholder engagement from the regulator, some doubt and concerns were expressed regarding whether these could be met in practice by SSM.

A number of elements appear to be at play here:
- A feeling that SSM should live up more strongly, or more pronouncedly, to its own core values.
- A felt absence over the last decade of SSM in the public debate and a tuning down of initial engagement activities that were deployed during the first years of SSM's existence[1].
- A general lack of clarity on the process ahead.
- A (too) strong technical orientation.
- A rather legalistic approach and emphasis on formal consultations.
- A perceived attitude of *"guardian of the project"*, rather than as *"guardian of society"* in relation to the repository facilities (and KBS-3 in particular).

We will further elaborate on each in the following sections.

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[1] Respondents raising this issue tended to refer roughly to the period of 2008-2011/2013.

SSM Core Values

During most interviews, whether individual, or in group, reference was made, albeit not necessarily explicitly, to SSM's core values: honesty (*vederhäftighet*), integrity (*integritet*), and openness/transparency (*öppenhet*).

Våra värdeord:	Our values:
- Vederhäftighet - Integritet - Öppenhet	- Honesty & Reliability - Integrity - Openness/Transparency
VEDERHÄFTIGHET innebär att verksamheten bedrivs utifrån saklig grund. Vederhäftighet uppnås när medarbetarna har **kompetens** och är **objektiva och sakliga**. Kompetens innebär att medarbetarna har den kunskap, utbildning och erfarenhet som krävs.	**HONESTY/RELIABILITY**[2] refers to conducting business on a factual basis. It is achieved when employees have **competence** and are **objective and factual**. Expertise means that employees have the required knowledge, training and experience.
INTEGRITET innebär att vi värnar om vår oberoende ställning och **inte låter oss påverkas i beslut, ställningstaganden, råd och rekommendationer**. Integritet är att våga **ta ansvar**, både i rollen som myndighetsutövare och som medarbetare.	**INTEGRITY** means safeguarding our independent position and **not allowing ourselves to be influenced in decisions, positions, advice and recommendations**. Integrity means daring to **take responsibility**, both in the role as a public authority practitioner and as an employee.
ÖPPENHET innebär att myndighetens verksamhet är **transparent för omvärlden**, att vi **tydligt och aktivt informerar** om verksamheten, om våra ställningstaganden, råd, rekommendationer och beslut. Öppenhet innebär också att vi **lyssnar på vår omvärld**.	**OPENNESS** means that the authority's activities are **transparent to the outside world**, that we **clearly and actively inform** about our activities, our positions, advice, recommendations and decisions. Openness also means that we **listen to the world around us**.
https://www.stralsakerhetsmyndigheten.se/om-myndigheten/sa-arbetar-vi/var-vardegrund/ (last consulted: 07/02/2024)	Own translation, with the aid of AI: https://www.deepl.com/nl/translator

Table 1: Core Values of SSM

Reference to these core values was generally positive, but some felt SSM does not always live up to them. Others pointed out that combined these core values raise both expectations and questions regarding SSM's willingness and capability of organising a 'true' dialogue. For what does *"listen"* (in relation to openness) mean, if (in relation to integrity) no influence whatsoever is claimed to be allowed on decisions, positions, advice and recommendations taken by SSM as an organisation, nor by its employees?

Several academics (particularly from the field of social sciences) and members of *Kärnavfallsrådet* furthermore pointed to the potentially problematic interpretation of honesty & reliability as a core value linking competence to being *"objective and factual"*. This was not to suggest that SSM should not strive to be as objective as possible and to seek a sound factual basis for any acts or arguments. But being honest also includes recognising decisions may need to be made in the absence of factual information, and that

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[2] Vederhäftighet proofed difficult to translate. We have opted for the combination of honesty and reliability, which seems the closest we could find in various online translation services. However, SSMs definition suggests it to be more about thoroughness and objectivity.

value judgements will always be made in relation to more complex issues such as modelling and predicting underground repository behaviour (e.g. choice of precision levels for statistical analysis). Referring to the work of Sheila Jasonoff (2003, 2007) the suggestion was made (by more than one respondent) that humility may be a better, or additional core value to strive for.

Scarce Interactions

All respondents, apart from the representatives of SKB, felt they had (too) little contact with SSM over the last decade. Contacts in the past, during the first years after SSI (the former Swedish Radiation Protection Institute) and SKI (the former Swedish Nuclear Power Inspectorate) were merged into SSM in 2008, were generally referred to as good to very good. Representatives of concerned municipalities and NGOs appreciated the efforts put in at the time to reach out to various stakeholder groups.

The **municipalities** felt that, throughout the process so far, particularly in the pre-licensing, but also in the licensing phase, SSM was approachable whenever they had specific questions. Having a single point of contact or liaison officer for that purpose was seen as good practice, as were the yearly meetings between municipality representatives and SSM management to stay in touch with upcoming activities. This had been the case for some time, but at the time of the interviews, this was no longer the case.

NGO representatives were more critical, having the feeling that after that first stage, SSM's efforts regarding stakeholder engagement became *"more on/off, and seemed like ticking the box"*. They painted a picture of an organisation (or at least parts of, or certain people within this organisation) wanting, but not clearly knowing how to be more open and engaged in dialogue. Various respondents, not restricted to NGO representatives, in that respect also pointed to SSM as very formal (too formal, according to some) when entering into contact with other actors.

Also, respondents from **county administrative boards** reported to have had less contact with SSM since those early days. In their opinion, that had partially to do with their differences in responsibilities and different regulations framing their work. With the plans for the KBS-3 repository moving forward, the respondents from county administrative boards saw a growing need for more regular exchange: *"to get to know each other better, to understand each other's positions regarding the repository project and related risks, and to cooperate more closely in assuring the safety and security of the repository site and its surroundings"*. However, without going into further detail, it was felt the legal framework created barriers for good cooperation. It was appreciated that SSM had taken the step to organise an exchange meeting in Kalmar to described their work with supervising the existing facilities, but four years had passed since, and hope was expressed for a relaunch and further continuation of that initiative, even if not formally required.

Lack of Clarity on the Process Ahead

As already indicated above (see Chapter 3) at the time the interviews started, there were a number of pending issues. The governmental approval of the KBS-3 repository and extension of SFR in Östhammar, and the Clink facility in Oskarshamn were granted at the start of our interview round, but the full licensing process had not been finalised at the time we spoke to our respondents. In its decision of January 2022, the Swedish government had

specified five conditions, among which that additional safety analysis by SKB and approval by SSM are needed before the beginning of construction, trial operation, and routine operation of the final disposal facility (Kärnavfallsrådet 2022a; Ministry of the Environment 2022). While the government's decision under the Nuclear Activities Act clearly states that it sees the realisation of the KBS-3 repository as a **continued stepwise authorisation process**, which it estimates to last about 17 years (ibidem), uncertainty remained as regards to how this will unfold in practice. Therefore, respondents indicated an expectation of some **more clarification** on what each of these steps is supposed to entail, how open or closed SSM considers the review process for each of these additional safety analyses to be, and what will happen in the following 5 to 6 decades before a licence for closure would be on the table. They expected this to take form via a planned **revision of the Act on Nuclear Activities**, which was still ongoing, even at the time of writing this report.

With regard to the continued stepwise authorisation process as conceived in the government decision, the Nuclear Waste Council in its State-of-the-Art Report 2022 questions whether the relative shortness of the period covering the stepwise process matches the government's acknowledgement that *"time assessments become uncertain in view of the scope of the construction project"* (Ministry of the Environment 2022 cited in: Kärnavfallsrådet 2022a: 21). The Council furthermore points to the fact that construction and routine operation will be going on in parallel for several decades, which is one of the aspects that makes stepwise authorisation of geological repositories something different than its application to other nuclear facilities (Kärnavfallsrådet 2022a).

In all, there seemed to be a general appreciation among respondents for such a process of staged requests submitted by SKB to begin construction, and to start trial and standard operations. But **without formal legal requirements** available at the time, questions were raised regarding what implications this would have on roles and responsibilities on either side and of various related actors. Typical questions put on the table during the interviews, were e.g.: What possibilities for public scrutiny during construction, operation and closure? What role for the municipalities, and other concerned actors? What funding for municipalities and NGOs to engage with the process? How will government decide on repository closure?

Of particular concern for the representatives of Kärnavfallsrådet was that current regulations *"shift the burden of proof"* from the implementer (and future operator) at the time of licensing to the authorities after licensing, if alterations to set licence conditions are deemed to be needed (e.g. as a result of new scientific findings, new risk assessment methods, etc.). Although a periodic safety review at least every ten years will be demanded, as for any nuclear activities according to the Act on Nuclear Activities, this is not so in relation to the Environmental Code. Furthermore, it was felt that this particular first-of-its-kind case could not be considered a nuclear activity as any other. Therefore, the Council had already insisted in 2020 that careful attention should be paid to how licensing terms are formulated in the first stages of the stepwise process of implementation and that such should not be left solely to implementer – regulator negotiations (Kärnavfallsrådet 2020: 51).

Some respondents also referred to **nuclear power** being **back on the agenda** since about 2020, whereas the nuclear waste programme was started with a phase-out in mind (at least for most concerned actors). Even though the current nuclear waste management programme and planned KBS-3 repository are explicitly limited to the decommissioning

waste and spent fuel from the existing reactors, questions were posed concerning the possible impact of a revival of nuclear energy production on the approved repository programme: Could this lead to future adaptations in repository design and what would that mean for the licence conditions? Could this lead to more repository facilities being needed?

Another issue that raised some concern among respondents was the **closing of a national debate** on the KBS-3 repository once implementation would start. As might be expected, representatives from NGOs were most insistent on keeping an open debate at the national level as part of a continued authorisation process, and during stepwise implementation. Equally, SKB representatives were keen on shifting the focus to the local level and to implementation, now that the fundamental decisions had been taken. The local actors themselves, representatives from municipalities and counties, expressed the hope that with the focus shifting more to the local, *"not only SKB, but also SSM would 'come down' for more regular interactions"*. However, they also felt this isn't merely a local issue, and broader national oversight was deemed to be needed. First, because the Swedish nuclear management system (as depicted in Figure 1) is a concept linking multiple locations, and second because of the long timescales involved, with expected evolutions in science and technology potentially influencing the stepwise implementation process. Some wondered whether SSM should be left as the only actor at the national level responsible for keeping track of that, mainly through reviewing SKB's three yearly national RD&D programme. In that respect, a number of respondents considered it problematic that Sweden does not have a tradition of regulatory authorities doing their own research.

In the same vein, most respondents stressed the **importance** thus far **of the role of the Swedish National Council for Nuclear Waste** in providing a place for transparency, public participation and (academic) scrutiny. This came particularly to the fore in the interviews conducted towards and over the summer, when it became clear the Swedish Government had no intention to extend the Council's mandate after December 2022. Up until then, the existence of the Council seemed to be taken for granted by our interviewees, almost unanimously pointing to a continued need to discuss evolutions in facts and knowledge alongside the implementation of a particular technological option. While most respondents did not appear to question geological disposal as such, nor contest a need to move toward implementation, all did stress the importance of not doing that with blinkers on. Though none referred to it as such, one could argue that most respondents saw the licensing decisions on the SFR extension and KBS-3 repository as a way of *"closing-up"* (Parotte, Macq, and Delvenne 2022) and a future role for Kärnavfallsrådet in assuring the 'up'. We'll come back to this in the next chapter. Therefore, many considered the discontinuation of the Council as a loss and hoped that this gap could be filled. Some explicitly referred to SSM, not necessarily expecting the regulator to take over this role of the Council, but rather to make it (feel) responsible for setting up or 'lobbying' for an alternative.

Strong Technical Orientation and Legalistic Approach

Another reason why there were some concerns among our respondents about SSM's capability to live up to their expectations regarding engagement and dialogue was that the organisation is seen by many as very technically oriented and legalistic.

None of our respondents questioned the need for SSM to be a competent organisation, and the need for strong **technical** competence, given the nature of its role and activities (cf. Core Values). However, many pointed out that other issues are also at play for which a

regulator should not remain blind. Reference was made in that respect to Kärnavfallsrådet's Nuclear Waste State-of-the-Art Report 2020, reflecting on the notion of *"good technology"* in relation to the final repository project. *"Value-awareness"*, *"transparency through open communication"*, and a *"comprehensive orientation of the surrounding world"*, are mentioned there as essential features for a technology to have a positive impact on society (Kärnavfallsrådet 2020: Chapter 8, p.131-153)[3]. Therefore, the following issues should also explicitly be recognised by and present in a regulatory authority:

- competences in social sciences and humanities,
- knowledge on ethics and how different publics perceive different technological systems,
- the understanding that any technology has social consequences, and that its development itself is influenced by the social context surrounding it.

Several respondents indicated they saw room for improvement for a stronger integration of social and ethical competences within SSM.

This strong technical focus, by some referred to as *"too technical"*, was seen to be met by a very formal or **legalistic** attitude, leading to avoiding contacts with stakeholders outside of formal procedures and consultations. Respondents from the municipalities and regional authorities, as well as NGO-representatives, pointed out that formal consultations weigh heavily on stakeholder resources. Therefore, they would also appreciate more informal contacts. Some respondents indicated it was easier to make contact with SKB than with SSM, and would prefer the regulator to take a more open attitude, even if not legally required to do so. In that respect, representatives from Kärnavfallsrådet stressed the importance of SSM to be explicit and clear about what its mission is, and how the regulator plans to intervene and advice in the future process. However, they also insisted an accompanying participatory process should not be too formal, as that would create barriers to engage and will not contribute to trust building.

By stressing the importance of informal contacts and *"getting to know each other and each other's concerns"*, our respondents echoed what Anthony Giddens (1990), borrowing from Erving Goffmann (1955) conceptualised as *"facework"*. Trust in institutions does not rely solely on formal institutional mechanisms providing assurances, checks and, if need be, sanctions, but also elements of interpersonal trust, of present and past experience with those representing the institution or organisation, and the level of agency granted to those representatives by the organisation.

We will come back on this in the following chapter of this report. For now, it suffices to point out that we noticed clear **differences in expressed trust vested in SSM** by different stakeholders. A clear positive appreciation was linked to prior experience of having a particular point of contact and regular (albeit not necessarily frequent) informal meetings as heads-up regarding the process of repository development in its broader context. Even though most respondents indicated a lack of interaction in the period prior to the interviews, this past experience remained for some, particularly the municipalities, the decisive factor in their judgement. For others, in particular the NGOs, the more recent experience of little interaction prevailed, colouring their overall judgement more negatively. Most respondents appeared to take a neutral position, expressing a basic trust in the good intentions of the regulator, but also referring to a perception of procedural injustice, due to the relatively

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[3] Other key features or "hallmarks" mentioned are: a "scientific basis", "competence management", "consequence-awareness and preparedness for reconsideration", and "awareness of long-term objectives" (Kärnavfallsrådet 2020: 134-140).

widespread impression of *"SKB being a privileged stakeholder"*. Interestingly, both among the neutral and less trusting respondents, a perceived lack of agency of SSM representatives seemed to have impacted their position. The paraphrased quotes *"SSM are very professional in the meetings, but they have no time to talk"* and *"It sometimes feels like SSM employees get told what to think"* illustrate this nicely.

Guardian of Society or Guardian of the Project?

Strongly linked to the issue of trust as just discussed, is the impression expressed by several respondents of SSM in relation to the repository facilities (and KBS-3 in particular) seemingly *"acting more as 'guardian of the project', rather than as 'guardian of society'"*. This impression was not shared by all, but we did find strong sensitivity to this symbolic balance across stakeholder groups. Therefore, we found it important to mention it as a point of attention for SSM when taking position in this matter in future.

The fact that the stepwise implementation process of the KBS-3 repository still felt like a black box to many respondents, and that there is as such no consultation obligation for SKB's preliminary safety report on KBS-3, did not contribute to a feeling of reassurance. Although both SKB and SSM acknowledge continuous further development and refinement of the repository design will be needed (e.g. regarding excavation techniques and efficiency of the facility lay-out), both also seem to consider this primarily as *"finetuning technical detail"* on which no societal debate is needed, and from which most people will feel alienated. Other respondents felt that nevertheless, a broader discussion than one between implementer and regulator remains needed: not on technical details per se, but on what details are important or not for long term safety, and why.

Furthermore, several respondents again referred to Kärnavfallsrådet's 2020 State-of-the-Art Report in which the Council insisted on further specification of the stepwise authorisation process, given that construction and operation will be taking place simultaneously over a long period of time. The Council argued that what is currently stipulated in the Act on Nuclear Activities in general for all types of nuclear facilities is not sufficiently specific for the case of a geological disposal facility for nuclear waste, particularly with regard to requirements for updating safety analysis reports and alterations to set licence conditions as a result of progressive (scientific) understanding (Kärnavfallsrådet 2020: 43, 47). At present, SSM is working on new regulation with more specific information, but that was not yet the case (or at least not common knowledge among our respondents) at the time of the interviews.

It is the existence of such opaque situations that feed sentiments of SSM as regulator being closer to the implementer, SKB, and its project, than to the Swedish public at large. In that respect, some respondents referred to statements from SSM such as *"We trust that SKB has the competence to develop the reference solution and realize this project"* not sounding very reassuring to more critical actors in society. A regulator, it was argued, should take a more critical stance (even if they agree that a project can go ahead) and make sure they are not perceived to leave certain stones unturned.

It is important to stress that this feeling of SSM not always being critical enough, or too often not being perceived as critical enough, was quite widespread among respondents. We already referred to representatives from the municipalities and councils portraying SSM as a rather aloof organisation, keeping their distance and not keen on uttering open criticism of the implementer. During one interview it was explicitly stated: *"The authorities are too*

far away and afraid of criticizing SKB. SSM needs to be more trustworthy.". But also SKB representatives stressed the importance of a more informal role of the regulator as a counterbalance to the implementor vis-à-vis other actors such as the municipalities and society in general.

Experience from Other Regulators

In this section, we summarise the findings from a group interview conducted with representatives from the regulatory authorities in Belgium (AFCN-FANC), Finland (STUK) and France (ASN), and an interview with a representative from the Canadian regulator (CNSC).

The Formal Role of the Regulator

If one exclusively focuses on national legal texts or mission statements, regulators' main mission is to protect workers, the public and the environment from the harmful effects of ionising radiation. If the legal documents address communication, it is generally referred to as the responsibility to disseminate neutral, objective and technical information on safety and security related to nuclear matters. Following the Nuclear Safety and Control Act 1997, the Canadian Nuclear Safety Commission (CNSC) is obliged to disseminate *"objective, technical and regulatory information to the public concerning activities of the Commission and the effects, on the environment or on the health or safety of persons, of the development, production or use of nuclear energy of the production, possession or use of a nuclear substance, prescribed equipment or prescribe information"*.

Moving beyond the national acts, the Aarhus convention is founded on the principles of participatory democracy and sets the framework to involve the civil society and the public in the regulatory framework. There are several steps during the licensing process where consultation is already foreseen, but in some cases, regulators can even go further. Parotte and Fallon (2020) identify the needs and expectations of various actors concerning long-term management of high level radioactive waste and the type of decision-making process they would like to see implemented based on an online enquiry conducted in Belgium. The 242 respondents out of 580 invited to take part, concurred that the nuclear safety authority, AFNC-FANC, should play a more active role in the decision-making process vis-à-vis the stakeholders. The position of AFNC-FANC was regarded as too closed compared to its French homologue, ASN, and the Canadian regulator, CNSC, which could be seen as examples of 'good practice'. In France, the law can be changed after the public consultation process, showing the influence of public participation in the decision-making process. Two public debates on the deep geological repository have resulted in the change of two regulatory texts: the first one in 2006 regarding the preference between surface storage and deep geological disposal of high-level waste and the second, in 2013, concerning the characteristics of the repository facility by implementing reversibility and including a pilot phase.

In the case of Finland, the mission statement from the radiation and nuclear safety authority, STUK, at the time of conducting the interview for this project, did not include any reference to dialogue or communication. Dialogue was mainly focused on the formal communication with the implementer and the licensees, particularly near the construction and operation of the repository. However, after the renewal of the webpage in 2023, one of the first

statements of STUK's strategy is: "*In a turbulent world, many expectations are placed on STUK. That is why our new strategy has put societal impact at the centre of its focus*". The mission statement reads *"the purpose of STUK's operations is to protect people, society, the environment and future generations from the harmful effects of radiation"*. One of the means of action towards these goals is defined in STUK's webpage as *"proactive social engagement"* meaning that STUK provides information to support decision making and actively debate in society[4].

Evolution of Dialogue

Respondents emphasised that the role of the regulator regarding dialogue with the different stakeholder groups changes over time, particularly in a long-term continuous geological disposal project. At each step of the process, the regulators concur that it is important to clearly communicate what can be achieved and the conditions to move forward to the next steps. The expectations will be different at each step, depending on the country and the societal interest, and hence, the motivation for the public to be engaged is also likely to differ.

During the pre-licensing phase, the regulators interviewed agreed that they mainly provided opinions, made statements and delivered advice. At this stage, the regulator usually asks the implementer to identify societal expectations in the concept and design and include them in the general safety case in order to avoid difficult discussions later on. The regulator needs to assess whether these expectations are relevant, if there are misunderstandings that need clarifications, if these are compatible with or relevant for safety or not and why. A recurrent question in this process is long-term monitoring, which could be considered as being in contradiction to the objectives of passive safety. Sufficient attention needs to be paid to these aspects early enough during the pre-licensing phase.

There was general agreement that the role of the regulator changes during and after the licensing phase. From then on, the regulator needs to make firm decisions on whether requirements are met or not, rather than provide advice as it was done in the pre-licensing phase. Still it was recognised that also during various stages of the implementation phase, the regulator also has the responsibility to explain and justify its decisions to all stakeholders.

Resources for Public Participation

Public participation is nowadays clearly considered a priority for regulators and a change of culture at the top management and better coordination of the management with the staff working on engagement is essential. In addition, training for staff working on engagement activities is also required. However, regulators recognise that they have limited resources for communication and engagement.

The case of Canada is of interest here as CNSC provides external resources for engagement and administer the following three funding programmes[5]:

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[4] https://stuk.fi/en/strategy
[5] https://www.cnsc-ccsn.gc.ca/eng/funding-opportunities/

- Participant Funding Programme to support participation from communities, Indigenous Nations, not-for profit organisations and individuals related to an assessment or licensing process (e.g. for attending public hearings or meetings);
- New Indigenous and Stakeholder Capacity Fund to build capacity for Indigenous Nations and communities to participate in and contribute to the CNSC's regulatory processes, programmes, policies and initiatives and to build relationships and trust with the CNSC;
- Research and Support Programme to generate knowledge and information (e.g. independent advice, expertise, experience and information) to support regulatory decisions.

Having long-term arrangements with First Nations is challenging because CNSC needs to build capacity and expertise, which requires a considerable amount of resources from the regulator.

These funding programmes are also accompanied by internal actions to address the challenges regarding communication and engagement in the organisation:

- Commission members participate in a survey to assess the value of the funding programmes;
- An independent funding review committee makes recommendations on the different applications received;
- Development of an internal trust strategy (see below – section "Public Trust").

Public Trust and Independence of the Regulator

The steady erosion of public trust in science and in the regulator in different countries calls for greater efforts to be made focusing on building relationships, talking to key leaders and influencers in order to get the public to consult the regulator for the facts. In Canada, one of the four strategic priorities of CNSC is to be a trusted regulator and a credible source of scientific, technical and regulatory information. The NEA report "Characteristics of a Trusted Nuclear Regulator" (2024) serves as a practical guide to explain the organisational characteristics, attributes and ways of thinking that can help a nuclear regulator build and maintain trust with interested stakeholders and the public. The CNSC prioritises building trust and relationships with Indigenous Nations and communities as well as other stakeholders. For this, CNSC is implementing an internal trust-building and a reconciliation strategy which complements the CNSC Strategic Stakeholder Engagement Programme[6]. The ongoing actions are based on modernising the proceedings and getting access to information from stakeholders, championing independence in the organisation and in the actions, engaging with stakeholders with sufficient resources and measuring trust through Key Performance Indicators.

In Finland, there is a concern that the public is passive and there is no overall debate on radioactive waste management. Although there might be a cultural reason for this passivity, this passivity might also entail a risk of losing trust in the long term. This observation from the regulatory authorities echoes the work on trust and social licence to operate of Lehtonen et al. (2021), which points out the *"strong ideological trust in the state, experts, and*

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[6] Canadian Nuclear Safety Commission 2023-24 Departmental Plan – CC171-28E-PDF: https://api.cnsc-ccsn.gc.ca/dms/digital-medias/CNSC_2023-24_Departmental_Plan.pdf/object

technology" in Finland, and the *"relatively weak citizen trust in NGOs as a source of information on energy policy issues"* compared to other countries.

Whilst it is important for the regulator to be actively involved in dialogue with civil society and the public, it is also clear that providing an independent view from that of the implementer and from industry is crucial. Respondents referred in this regard to the safety case, stipulating it is not the regulator's role to defend it, but to explain the associated regulatory framework, to comment about its review and to inform about the advice provided.

According to our respondents, independence is also shown through maintaining a separate R&D programme and supporting different research projects. This allows the regulator to both develop its own competences and build trust. As mentioned above, maintaining independence was not equated with being detached from other stakeholders or as working in isolation. As stated in NEA (2024), one of the characteristics of a trusted regulator is being independent (politically, financially and technically) and objective. Regulators should maintain regular interactions and transparent dialogues with stakeholders, upholding public accountability. At the same time, they must ensure that their decisions are informed by the best available science and a comprehensive understanding of the associated risks.

Tailoring Approaches

Tailoring dialogue and communication approaches to different groups of stakeholders is crucial and having a virtual and in-person presence is crucial to be able to build trust.

The personal relationships between the regulator's staff and the local elected representatives, e.g. mayors, is one of the biggest challenges as people retire or move to new positions and there needs to be commitment between the two parties. Another challenge for a continuing relationship is the electoral changes at national and/or local levels and the decisions which follow. In Sweden, the national government coming into power in 2023 decided to eliminate the State funding of the local safety boards[7] in municipalities with non-operating nuclear power plants, namely Kävlinge (Barsebäck nuclear power plant) and Nyköping (Studsvik research facility)[8]. These two municipalities still have other nuclear installations but lack now the capacity to communicate with the management of these nuclear facilities. At the same time, the government presented a new legislation to promote new nuclear power plants and Small Modular Reactors (SMRs) in municipalities with no prior experience with nuclear. Eliminating these communication channels has weakened the message of safety and confidence to local stakeholders.

Respondents testified to the relentless efforts being made by regulators in the field to interact respectfully with the different stakeholder groups. The Office for Nuclear Regulation (ONR) in the UK and the CNSC regularly organise Forum meetings with NGOs and site stakeholder groups to actively listen to their concerns and questions. In addition to the formal forum, they also organise post-meetings with NGOs to respond to questions such as: how are you going to follow up; are there any fundamental issues not addressed; what have we heard; can we rethink how we approach these issues, etc. This approach has

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[7] The local safety boatds were established by law in 1981 with the main purpose to obtain insight into safety and radiation protection matters and to inform the public about these areas. Their members are appointed by national government.
[8] Swedish Constitution Collection (SFS 2022:1745) changing Ordinance (2007:1054) with instructions for local safety boards at nuclear facilities.

helped build trust, confidence and understanding in the regulator. However, it takes time and money. Staff at the regulator are often overwhelmed by the amount of questions they get and the need to tailor the answers to diverse publics.

In France, civil society is represented by the Local Information Committees or Commissions (CLIs) which are close to nuclear facilities and involved in regular exchanges with the implementer ANDRA, who is responsible to implement the public dialogue. At the stage of pre-licensing, the regulator has no obligation to discuss with the public but is invited by ANDRA to present the regulations. The installation of such a CLI is mandatory (by law) in relation to all nuclear facilities[9], and thus also for a deep geological repository. All CLIs[10] are united in a national umbrella organisation, the ANCCLI[11]. At the national level, a working group associated with the national radioactive waste management plan includes representatives from the ministry, ANDRA, the (ANC)CLISs, ASN, etc. The working group members meet every two months and presentations are held by CLIs, ANDRA or other stakeholders on the topics of interest for the geological repository or on waste management issues in general. However, during the licensing phase, from when ASN received the authorisation application from ANDRA until the public enquiry, the regulator needs to organise meetings to consult civcil society.

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[9] Which makes them comparable to the Swedish Local Safety Boards in communities with nuclear facilities.

[10] Most use the acronym CLI, some have adopted the name of the commission to local specific needs. Therefore one can also find the acronyms CLIN or CLIS. In the case of Bure and surrounding municipalities on the border of the regions of Meuse and Haute-Marne, where the French underground research laboratory is situated and a deep geological disposal project (Cigéo) is planned, the local commission is goes under the name of CLIS. The S here stands for *"Suivi"* or follow-up of the laboratory and subsequently also the disposal project's development.

[11] For more information, see https://www.anccli.org/anccli-mission/

5. Potential for SSM Dialogue

This chapter builds further on the findings as presented during the online workshop on September 15th 2022. Results from the interviews are linked to reflections and insights from literature. As such, we aim to indicate the potential and possible pathways for including (local) stakeholder participation in the regulatory mission.

As presented in the previous chapter, in today's society, whether that be Sweden or another democratic nation, **a regulator is expected to act in the 'general interest', and to combine a neutral and factual position on the one hand, with an engaging and receptive attitude towards a diverging range of stakeholders on the other hand**. This resonates well with a growing recognition that, in addition to scientific judgement based on facts and figures, also emotions, ideological preferences and value judgements play a part in how a society can and will respond to (technological) risk (e.g. Nusssbaum 2001; Roeser and Steinert 2023, Steinert and Roeser 2020, Taebi, Roeser, and van de Poel 2020). It puts regulatory agencies in the environmental sphere before a challenging set of tasks: *"… not only should they effectively protect the environment, but they should also find ways of doing this efficiently, equitably, and thus, in ways that are politically, economically and socially acceptable."* (Lange and Gouldson 2010: 5235). Such a challenge impacts the field of possibilities regarding regulatory styles, defined by Vogel (1986) as characteristic patterns of interactions between regulators, regulations and those regulated.

Regulatory Styles

Different typologies of regulatory models or styles can be found in literature. Terminology may differ, nuances exist in naming causal relations, and some authors (e.g. Mol, Lauber, and Liefferink 2000; Renn 1995, 2001) present more fine-graded typologies. Nevertheless, in general a distinction appears to be drawn between **two stereotypes**: a *"cooperative"* and *"adversarial"* style, often depicted as the European versus the American way (Coglianese 2017; Lange and Gouldson 2010). A cooperative style, sometimes also referred to as consensual, contractual or compliance-based, is characterised by negotiation, conciliation and compromise, an emphasis on promoting self-regulation and compliance, but also by elitist decision-making and customised regulation lacking transparency. Whereas an adversarial, legalistic or sanctions-based style, manifests itself through conflicts of interest, compulsion and coercion, a system of procedural checks-and-balances, standardised statutory obligations, litigation and sanctioning, leading, as some argue, to more transparency and possibilities for public participation. For various descriptions of both styles, see: Brickman, Jasanoff, and Ilgen 1985; Coglianese 2017; Hawkins 1984, 2002; Kelman 1981; Lange and Gouldson 2010; Löfstedt 2004; Löfstedt and Vogel 2001; Lundqvist 1980; O'Riordan 1985; Scholz 1984; Vogel 1986.

By the end of the 20th century, this difference in style between Europe and the US, appeared to have become somewhat blurred, as various authors reported cases of consumer and environmental regulations becoming more strict and less case-based in Europe (e.g. Bressers, De Bruijn, and Dinica 2007; de Clercq 2002; Durodie 2000; Heyvaert 1997; Landry, Roberts, and Thomas 1994; Lodge 1994; Majone 1996), and a tendency towards more self-regulation and voluntary or negotiated agreements in the US (e.g. Ashford and Caldart 2001; Carraco and Lévêque 1999; Coglianese 1997; Delmas and Terlaak 2001; Freeman 1997; Orts and Deketelaere 2001; Suskind, Levy, and Thomas-Larmen 2000;

Suskind and Secunda 1998). Some authors consider these observations proof of a *"flip-flop"* of regulatory systems operating on opposite ends of the spectrum just described, invoked by a decrease in credibility of the existing system on each side of the Atlantic (e.g. Löfstedt and Vogel 2001; May and Winter 2000; Vogel 2012). For others, it is a manifestation of a global convergence towards a third style, labelled *"responsive regulation"*, and characterised by a deliberative and flexible choice between regulatory strategies, ranging from voluntary and negotiated to interventionist and coercive, based on listening to multiple stakeholders (e.g. Ayres and Braithwaite 1992; Braithwaite 2002, 2016; Braithwaite, Murphy, and Reinhart 2007).

Regulatory Style(s) in Swedish Nuclear Waste Management

The authors of this report take the position of Coglianese (2017) that **style does matter**, but that with regard to regulatory systems, the styles distinguished in scientific literature, describe first and foremost patterns in behaviour of inspectors, inspectorates and/or other actors within a regulatory system, not constitutive components of the regulatory system as a whole. This is important, as from that perspective, we see **patterns responding to both stereotype styles present in the Swedish regulatory practice concerning the management of radioactive wastes**, which we consider a particular **subset of the Swedish nuclear regulatory system**.

We see **differences** occur **over time**, for example related to stages in what could be referred to as stepwise decision-making in relation to final disposal (NEA-FSC 2004). But also **differences between practices related to the Act on Nuclear Activities and those related to the Environmental Code**, as there are two parallel regulatory process for nuclear facilities within the Swedish legal system. This should not come as a surprise. Variations in regulatory practices are to a large extent coloured by socio-political and cultural differences. Often this is made explicit in comparative analyses within specific regulatory fields, identifying variations in terms of national or regional differences (e.g. in the nuclear field: Lehtonen 2010; Lehtonen et al. 2021). But this obviously also leads to variations across domains or fields of regulation within a country or region, which is the case here.

We don't want to go as far as concluding that therefore, we can label the Swedish regulatory system for nuclear materials, and waste in particular, an example of *"responsive regulation"*. However, we do follow Braithwaite (2002, 2016) in his view that **regulatory practices** are not to be understood as set-ways of going about their business, but **as the application of the most fit-for-purpose from among a range of possibilities**. The question then becomes: **Who decides, and how, what is fit-for-purpose?**

With regard to the **"Who?"**, Braithwaite (2016) will argue that this cannot be decided upon by the regulator and the regulated alone, but that at least some third party (either singular or plural) is needed in order to avoid any possible hint of favouritism in regulation. Concerning regulation in the nuclear field, this appears crucial, as it is a highly specialised sector characterised by a limited amount of players (particularly at the national level) and a relatively small number of people possessing the knowledge and expertise required to safely manage this technology. Hence it becomes almost inevitable to have skilled employees travel between jobs in the nuclear industry and the regulating body or bodies. Given the small amount of players involved on the side of the regulated, regulations inevitably become far more custom-made than will be the case in sectors with a vast range of players dealing with less complex technologies (e.g. the distribution sector). In several

countries (e.g. Belgium, France or Germany) the waste manager is a third party, often a government related agency, somewhere in the middle between industry and regulator, but also dependent on both. In Sweden, but also in e.g. Finland, Canda and Switzerland, the waste management company is directly related to the industry, which brings the playing field basically down to two parties. Two parties, bound to each other, whether they, or other concerned groups in society or the public, like it or not. Such a close relationship doesn't have to be negative per se and can in many respects be positive, both in terms of efficiency and safety, as literature suggests a trust relation between the regulator and the regulated can have a positive impact on compliance (Coglianese 2003). But it will always fall short in terms of equity, socio-political support and trust building in relation to those outside of the inner-circle looking in and wondering what is going on.

The repeated concern expressed by our respondents about Kärnavfallsrådet's mandate being lifted points exactly to this problem. The council provided a space for additional checks-and-balances and for trust building in the system. Arguably without the council many different third parties still remain, but none that could represent in a similar way the third pilar in Braithwaite's (2016) *"tripartism in regulation"*. The lack of such a third pilar should not be taken lightly, and it would be highly recommendable to seriously consider possibilities for filling the void, suggestions for which can be found in Kärnavfallsrådet's final State-of-the-Art Report and Final Report of 2022 (Kärnavfallsrådet 2022a, 2022b).

With regard to **"How?"**, as far as our knowledge goes, literature does not provide a clear and fully suitable framework for determining this. Braithwaite and other authors on responsive regulation suggest what we interpret as a 'contextual cost-benefit analysis' of the need of being more coercive or not, with the assumption that one opts for the least coercive or most cooperative practice until that proves to be insufficient (Braithwaite 2016). Cooperative strategies are considered to be more effective in terms of compliance, whereas more stringent and punitive strategies are to be deployed in case of deterrence (Schell-Busey et al. 2016, referring to: Ayres and Braithwaite 1992). Sound as it may be to base regulatory practice on a combination of what in policy literature is often referred to as 'the carrot' and 'the stick', more seems to be needed to differentiate between regulatory strategies and practices, and identify the one (or combination) that is fit-for-purpose for a particular regulatory challenge (in our case, the management of nuclear waste).

We feel that two alternative typologies for the classical dualism between cooperative and adversarial styles, namely that of Renn (1995, 2001) and Mol et al. (2000), can offer some help in this regard:

- Mol et al. plot regulatory practices on a matrix corresponding to the extent to which they incorporate public-private interaction (labelled as *"jointness"*) and rely on voluntary actions (labelled *"voluntariness"*) by those regulated (Mol et al. 2000: 2-4). Thus combined, they arrive at four archetypical regulatory styles, labelled: (1)*"negotiated rule-making or regulation by consensus"*, (2) *"unilaterally imposed regulation"*, (3) *"joint policy making"*, and (4) *"self-regulation"* (ibidem: 4). A visualisation of this matrix is provided in Annex 3. We will not venture further into the detail of this framework, or the archetype styles derived from it. For the purpose of this report, it suffices to retain that this model adds a second layer to the cooperation – coercion (or voluntary – obligatory) distinction, namely the amount to which other than those regulated are given a role in the regulatory system[12].

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[12] Though this comes close to the question of "Who?", discussed earlier in this paragraph, there is a subtle nuance in that the first deals with who has a say in what features the regulatory system should possess, whereas here the focus lies on who participates in it and on role-division between those involved.

- Renn takes a somewhat different view and puts forward the role of scientific knowledge, and how this is embedded in legally prescribed procedures as the distinguishing factor in characterizing regulatory action. He identifies four different *"policy styles for regulation"* (Renn 2001: 406-408) [13], differentiated according to:
  - o their openness for public scrutiny, and the preciseness of procedural rules (which we interpret as closely related to Mol et al.'s features of jointness and voluntariness);
  - o the expressed objective of, or legitimation for, the decision-making process; and
  - o the importance granted to various inputs (such as empirical evidence, legal arguments, stakeholder interests, public perception, etc.), and the subsequent role attributed to science in the decision-making process (e.g. experts as advisors or as rule-makers).

This leads him to distinguish an adversarial, a fiduciary, a consensual and a corporatist approach. In globo one could argue the adversarial approach as identified by Renn, aligns with the traditional 'American way', whereas the other three are more nuances representations of what is traditionally understood as the 'European way' of cooperative or negotiated regulation presented above. Though Renn himself attributes the consensual approach rather to Japan, the corporatist to Northern Europe, and the fiduciary approach to Southern Europe (Renn 2001: 409). In Annex 4 we have reproduced Renn's own table in which he characterizes these four approaches according to the features just described.

In this report we will not go as far as to suggest what style (or combination of styles) would be fit-for-purpose with regard to nuclear waste management in Sweden. That would go beyond the scope of our research set-up and is also not up to the authors of this report to decide. The typologies discussed briefly above we think could be of use to SSM when considering, in dialogue with its stakeholders, why and with whom engagement is important and how that can best be set in place, as each of these styles have a distinctive features which makes them suitable for one situation, but not necessarily for another.

Regulating in Style

"Given how much a regulator's success is dependent on others, the ways that a regulator interacts with industry, with concerned members of the public, and with other governmental entities will prove instrumental to its attainment of excellence." (Coglianese 2020: 9)

We began this chapter by stating that a regulator today is expected to combine a neutral and factual position, with an engaging and receptive attitude towards a diverging range of stakeholders. Regulatory excellence, Coglianese (2020: 10) argues, does not only depend on technical expertise, but also on *"people excellence"*, that is *"to possess and sustain an internal culture that fosters and reinforces humility, openness, empathy, and a steadfast commitment to public service"*.

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[13] These features are not labelled as such by Renn himself. He refers to four factors influencing regulatory styles, namely *"The selection rules of what the policy makers regard as important and helpful"*, *"The processing rules for scientific information within the policy-making agencies "*, *"The rules for mixing expertise with anecdotal evidence and strategic maneuvering"*, and *The rules for legitimizing policy decisions in the public"*(Renn 2001: 407). However, these features appear to overlap to a certain degree and are not explicitly upheld by the author as separate factors in the characterization of the regulatory styles he subsequently distinguishes (Renn 2001: 408). Therefore we have provided our own interpretation of what we consider to be relevant differences between the four proto-type regulatory approaches put forward by Renn.

In this report we focus on exactly that question of *"people excellence"*, on what in literature on regulatory performance is referred to as process-oriented criteria, such as legitimacy, credibility and trustworthiness. Regulatory action in the 21st century is open and participatory (Löfstedt 2004); combining forms of cooperation between the regulator and the regulated, and (early) involvement of the public and public interest groups through dedicated forms of interaction, with a mediating and interpretative role for the sciences (Renn 2001). On this, there seems a good match between what literature describes and what we drew in terms of expectations from Swedish stakeholders in nuclear waste management.

Therefore, we will now turn to key messages from our empirical material that can help SSM to develop an appropriate strategy for combining "technical excellence" with "people excellence", with emphasis on the latter (for the purpose of this report), and a particular focus on how to include (local) stakeholders in the regulatory mission after licensing.

Managing Expectations

Another parallel between literature and our empirical findings, is that expectations differ regarding what could be expected from a regulator in terms of engaging with different stakeholders. On this, it would be advisable for SSM to take a clear stance.

Involvement or participation is easily regarded as equal to striving for consensus, but should not be confined to such ambition. **Consensus building does not have to be a prerequisite for an effective dialogue informing regulatory decisions**, and can actually lead to situations of comparative exclusivity, as it is hardly ever possible for such consensus to reflect the agreement of all those affected, and it can put disproportionate burdens on different participants or participant groups (Coglianese 2003). Given the breadth of concerned actors, and the incommensurability of some positions taken in the case at hand, it would not seem feasible to strive for participation with the purpose of seeking full consensus. Therefore it would not be recommendable, and potentially counter-productive if it would be implied this were the case. Or worst, if it would be left undertermined what the purpose of the strived for participation was.

As reported in Chapter 3, concerned actors have varying opinions (even within actor groups) on what a dialogue should entail. Yet most, if not all, acknowledge potential legal and practical constraints exist and maybe not all expectations can be met. So **what role does SSM itself see for dialogue** (or dialogues - see further) **and how should this be organised?** This is a question only the regulator can answer genuinely for itself, but for which we hope some inspiration can be found in this report. An obvious, but nonetheless often overlooked limit to expressed ambitions, is the ability to attain them with the current resources. In that respect some respondents indicated SSM should also be clear on what it cannot or will not aspire to, and why.

In this respect, our respondents had an additional, and strongly related request to SSM: to **be clear about what to expect from a 'continued stepwise authorisation process'**. If this is considered as 'mere technical finetuning', only few respondents saw any value in engaging further with the regulator. Many did see several issues that go beyond such technical finetuning and therefore could be subject to further dialogue. However, several respondents also indicated a perceived lack of vision by SSM to see beyond the technical, or at least some hesitance (from both the implementer and the regulator) to acknowledge that there remain decisions to be made that are not purely technical in nature, and that

"participation should ... be understood as something that actively develops a socio-technical system", such as a geological repository for spent nuclear fuel (Kärnavfallsrådet 2022a).

Making the Continued Stepwise Authorisation Process More than Mere Technical Finetuning

As referred to before, the continued stepwise authorisation process for the KBS-3 repository was set as a condition in the government's decision of January 27, 2022. However, as pointed out by the Nuclear Waste Council in its State-of-the-Art Reports of 2020 and 2022, in the case of a geological repository, construction and operation will be taking place simultaneously for several decades, making it difficult to draw a line between both, and to consider the start of operations as the end-point of the stepwise authorisation process (Kärnavfallsrådet 2020, 2022).

Such a staged approach fits well with what Parotte (2018) and Parotte et al. (2022) conceive as *"closing up commitment"*, providing a more nuanced understanding of Stirling's well-known division between appraisal – the stage of acquiring information and knowledge, from R&D to pre-licensing enquiries – as *"opening up"* and commitment – the stage of the actual decision making and commitment of resources – as *"closing down"* (Smith, Stirling, and Berkhout 2005; Stirling 2006; Smith and Stirling 2007; Stirling 2008). Looking at the licensing decision in the case of a geological disposal facility as a *"closing up commitment"* allows on the one hand the narrowing down of the available options, while on the other hand leaving room for further (refinement) of implementation conditions and opening up for new issues in case they arise. Closing 'up', rather than 'down', recognises that decisions have to be taken at some point; however, in situations where no full consensus can be reached, disputes over preferred options will remain, and uncertainty remains over certain incalculable dimensions (Parotte 2018; Parotte et al. 2022). It thus provides as way of *"guaranteeing a form of accountability for the technological choices that are made and of maintaining a critical memory of the rationalities behind each choice"* (Parotte et al. 2022: 20).

Without referring to the concept themselves, we noticed among our respondents a form of understanding the **continued stepwise authorisation process as a way of "closing up"**, involving more actors than merely the regulator and implementer. However, at least at the time we spoke to them, there was a felt obscurity among our respondents about the type of playing field an rules of the game for this first-of-its-kind extended licensing process, leaving potential players in doubt about whether and how they could participate. Regarding the **design of the different stages in the process**, respondents expected the regulator to take a lead in this, and also not to confine this action to consultation with the implementer only. The process should **take into account concerns and expectations from various concerned actors**, including the wider public, and **incorporate** that these concerns and expectations may change over time. As also referred to in Chapter 4, **not only concerns and expectations may change over time, also the context** (physical, technological, social, financial, legal, …) around the repository project may change. In that respect, Kärnavfallsrådet took the position in 2020 that *"It is likely that the project will not proceed as planned for the duration of the minimum 70 years SKB estimates it will take. For this reason, it is important to be prepared for changes and for developments to not go as planned"* (Kärnavfallsrådet 2020: 52). For that reason, the Council argued in 2022 for continued research/analysis and demonstration of the barriers and the repository environment up-until final closure, as a condition for long-term safety (Kärnavfallsrådet

2022). As we also understood from the interviews, SSM is expected to take to heart more explicitly that this disposal project will take a long time to materialise and therefore inevitably will be facing changes both internally, as in relation to its context.

Furthermore, it was argued, that SSM could acknowledge more clearly the wider perspective of nuclear waste disposal being linked to other (nuclear) issues with a potential impact on safety. That is not to say that the process should be redesigned continuously, rather it implies that a continued stepwise authorisation process should **include an arena to deal with emerging issues**, or even to revisit particular questions, should they pop-up again. In brief, an arena is needed **to assure the 'up'**. On the national level, Kärnavfallsrådet was a clear example of such an arena in the process before the principal licensing decision. Although obviously different in nature, the local safety boards around nuclear power plants or nuclear installations could also have provided arenas to assure the "up" on a local or regional level. They continue to exist in Östhammar and Oskarshamn, but upon governmental decision (see also Chapter 4) will no longer be continued in municipalities where nuclear power plants are being shut down and decommissioned or awaiting decommissioning. With that, another set of potential arenas to engage in the continued stepwise licencing process that is not confined to the host community will be no longer available.

We see this as potentially problematic and would like to endorse the position taken by Kärnavfallsrådet (2022a: 27) that *"More actors than SKB and SSM should be involved in the stepwise licensing process, the overall evaluations and the continued research programmes."* and that *"The need for broad participation, openness and insight in a continued process exists during the entire, long course of the project and after it"*. We strongly recommend to consider putting into practice the already mentioned suggestions by the Council. That is not to say this should fall fully under the responsibility of the regulator, but SSM could at least take up the role of proponent of arena(s) for transparency and 'closing up'.

Issues that were referred to by respondents (see Chapter 4) as **having potential to be subjected to further dialogue as part of the stepwise process**, but the status of some remaining unclear to them, were:

- Licence conditions and 're-examinations' (e.g. after the trial operation stage)
- Monitoring: to what extent will there be monitoring of the facility, what expectations and what role for SSM?
- Who and how to decide on closure?
- How to prepare for the post-closure phase: what role for whom?
- How to address the future in a broader sense? E.g. keeping memory, assessing the impact of a changing context (e.g. new nuclear technologies, geo-political evolutions, …)

In addition, some respondents also referred to SKB's three-annual research programme as a topic on which to graft continued dialogue.

Several of these issues remain open today and are clear examples of the usefulness of the concept of 'closing up'. All merit further exploration and hold the possibility for identifying specific roles for other actors than the implementer and regulator.

On the Role of the Regulator in a Continued Stepwise Authorisation Process

During the interviews the question "What role for dialogue?" was often turned around to "What role for the regulator?". Both obviously coincide to a large extent and the responses collected with regard to the latter can inspire SSM when considering options for dialogue.

One clear message from our respondents, was a request toward the regulator to **act more rather than react**.

- First and foremost with regard to <u>filling out the specifications of the continued stepwise authorisation process</u>, as indicated in the previous section. The role of the regulator was seen as far too important to stand aside and let others decide on the process for them; a viewpoint echoed in scientific literature on the subject (e.g. various contributions in Coglianese 2016).
- Second, it was mentioned on several occasions that also in the field of (technical) knowledge, it would be preferable if the regulator could take <u>a more proactive role</u>, possibly even engage <u>in research</u> (projects) itself, and this particularly with regard to dimensions with remaining uncertainty. We understood that SSM does have a minor technical research programme, but that it is not common in Sweden for regulatory authorities to do or to commission their own research. Some of SSM's analogues in other countries tend to pursue this more explicitly, even though they also acknowledged struggling with limited resources. <u>Acting as 'the people's expert'</u>, through building up knowledge and sharing that with other concerned actors, including the general public, was a clear expectation uttered by various respondents and those from the concerned local communities in particular. Such expectations echo what we also find in literature: *"... regulators must obtain detailed mastery of the technical aspects of their work and the operations of the industry they oversee. Even if they cannot match industry entirely in technical research and development, they must ensure they have the in-house capability to assess the actions and associated risks of industry operations sufficiently ..."* (Coglianese 2020:10).
- Third, <u>more (pro)active communication</u> from the regulator, was something a number of stakeholders had missed over the last years, and clearly hoped to see (again) in the near future. We will discuss this in further detail in the next paragraph.

The expectation from SSM to **communicate more (pro)actively** refers to both primary concepts of communication: sending and receiving or to put it more plainly, not only talk but also listen.

- With regard to <u>(pro)active talking</u>, various respondents insisted they would prefer SSM to **share** more often, and more explicitly, **its opinion** in relation to projects. A feeling prevailed that the regulator communicates primarily, if not only, by means of formal interventions at formal events, and that it sometimes appears to be frenetically holding on to providing value-free statements. The latter relates to the discussion in Chapter 4 and the section on SSM Core Values. While nobody disagreed that regulatory opinions concerning nuclear safety should be based on facts, several respondents encouraged SSM to acknowledge more explicitly that there are also value judgments, and that also a regulator interprets factual information from a specific perspective, or may need to take decisions in the absence of clear factual information.
  In relation to the continued stepwise authorisation process, an example of an opinion statement that would not have to be confined to formal interventions could be to inform stakeholders and the public about knowledge gaps and issues that still remain to be addressed. Preferably, such communication would include how these knowledge gaps

are (expected) to be addressed, when - or in what order - further decisions need to be made, and what implications a yes/no - or go/no go - could entail.

- However, investment in (pro)active talking requires at the same time investment in (pro)active listening. In order to convey messages in a meaningful way, that is to say, in assuring as much as possible that they will be received and understood as intended, communication should be targeted to different audiences. And to be able to do so, one needs to **consider and understand expectations from outside**, as well as the nuances in, and differences between these expectations. Even though SSM's Core Values clearly state *"Openness also means that we listen to the world around us"* (see Table 1), during a discussion session with a group of SSM staff members the point was made that: *"At SSM we are used to telling, we are less used to listening"*. Even if (pro)active listening today is not (yet) engrained in the authority's DNA, it would be recommendable to invest more in this skill, as it is the basis for developing mutual understanding, which is an important basis for gaining trust.

In the case of the nuclear or nuclear waste management regulatory system, communication from the regulator to various stakeholders and the general public is not primarily aimed at informing them on their own behaviour or contribution to the safety (and security) of a licensed facility. Its focus is predominantly on informing in light of acquiring confidence and trust in the regulatory system itself. In view of its role to act in the general interest and to take on a neutral position, this should not be understood as contributing per se to building confidence and trust in the implementer and its project, but rather on them operating within a tightly controlled framework. The relatively widespread perception that SSM often appeared to act as 'guardian of the project', and the expectation to act more as 'the people's expert' are very meaningful in this regard.

For effective trust building to occur, Kroeger (2017: 500) argues that *"symbolic actions must be interpreted similarly by the participants to the relationship"*, and that *"deeds tend to speak louder than words"*. In this particular case, deeds and words to a large extent collide, as most regulatory action exists in reporting and taking position, even if this has been preceded by various forms of active inspection. Still, we can differentiate here too between words or communication as 'deeds' and words in relation to an organisation's mission statement, values and world view. Therefore the following three questions remain important for stakeholders in judging an organisation's (in this case SSM's) trustworthiness: (1) Does it speak my language? (2) Does it have acceptable values? (3) Is it capable of effectively putting them into practice? (Kroeger 2017). From our analysis in chapter 4 it can be deduced that with regard to the second question, most respondents would seem to agree. However, regarding questions one and three, opinions tended to differ more.

Arguably, this has been influenced by a lack of visibility (or visible position taking) of the regulator as an organisation and a lack of interaction with individual representatives from SSM during the last stages of the licensing process. Or, as literature would put it: a lack of 'facework', which we define here, inspired by Kroeger (2017) as 'the translation of interpersonal trust into institutional trust through the conduct of representatives who are seen to draw on institutionalised rules and resources guiding their individual agency in specific situations'. Key elements influencing the effectiveness of 'facework' referred to in literature are: structural, situational and representational coherence (Kroeger 2017: 501-503). *"Structural coherence"* (*rules and resources*) would appear to be relatively well covered by SSM. Some room for improvement was seen regarding the regulator's limited resources for developing its own research programme. *"Situational coherence"* (*the clarity and coherence of the face-to-face encounters*), can at this stage be seen as rather low, given

both the past experience by several stakeholders of interactions with SSM changing over time, and the unclarity for many of the process ahead and of the possibilities and settings for future interaction. Finally, *"representational coherence"* (*the level of agency, creative and transformative capacity granted to representatives*) also holds room for improvement, following the perceived lack of agency of SSM representatives by various respondents, as referred to earlier in Chapter 4.

Directly linked to the notion of 'facework', is the remark made by respondents from the concerned municipalities most explicitly, but also from regional authorities and NGOs that **regular contact** with the regulator for them is a fundamental pillar of (pro)active communication. Regular contact, but therefore not necessary frequent. A particular expectation from the municipalities was for the regulator to come and visit: *"The law dictates the implementer to have regular contact with the concerned municipalities. That should also be for the regulator"*. Reference was in that respect made to the local safety boards[14]. Respondents emphasised a preference for such regular contact to be based on personal contacts. Some referred explicitly to a past practice of having a regulatory liaison-officer for particular stakeholder groups, which they saw as an excellent way of getting to know each other and stay in touch, that is to say, of putting the theoretical notion of 'facework' into practice.

Although not literally referred to in this way, our respondents saw an important role for **SSM as ombud**: an organisation that is there to help others understand and to answer questions and concerns from various people and organisations. This role seems to connect well to the mandate given by government to the regulator[15]. However, while SSM's Core Value of *"Openness"* and the related commitment to *"clearly and actively inform"* and - as just mentioned - to *"listen"* (see Table 1) implicitly provide ground for such a role, in practice this could be made more explicit. The emphasis put on acting as ombud and acting as the people's expert offers a useful framework for organising dialogue. No one (the inevitable exemption to the rule notwithstanding) is expecting SSM to enter into dialogue with various stakeholders to negotiate about (its) position(s). The purpose of dialogue is to make either party engaged attentive to what is going on: for SSM to understand questions and concerns of different stakeholders, and for the stakeholders to understand the situation and SSM's position. Taking an open and inquisitive attitude and engaging in dialogue can enable SSM to not only be the eyes and ears for society with regard to nuclear safety, but also to be more clearly recognised for it.

As a last remark, one could argue that acting as ombud and acting as the people's expert are different roles. However, they would not have to be mutually exclusive. In the current organisation chart, one could see the role of people's expert being enacted in various ways by each of the three outward oriented Departments within SSM, that for "Regulation and Knowledge Development", "Emergency Preparedness, Security and Licensing", and "Supervision". The role of ombud could be taken up by a dedicated section across departments (which admittedly doesn't seem to fit very well the overall structure). Or it could be part of or a subsection of either the section for "Communication" or the section for "General Public and Environment", although the later might be too specific in focus. What is striking, when looking at the regulator's organisation chart (see Figure 2, presented

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[14] Note that the interviews took place well before the government decision to abolish these local safety boards for NPPs that are shut down, as referred to in the previous section.
[15] See §7 of Ordinance (2008:452) with instructions for the Swedish Radiation Safety Authority, https://www.riksdagen.se/sv/dokument-och-lagar/dokument/svensk-forfattningssamling/forordning-2008452-med-instruktion-for_sfs-2008-452/

in Annex 5) [16], is that the Section for Communication is presented as a subdivision of the Department for Regulation and Knowledge Development. On the one hand, this holds the promise of seeing communication as dialogue and as an important element of knowledge development. On the other hand, it suggests communication is restricted to the activity of just this one department within the organisation. Hiding, even though not intentionally, as one can only assume, the section for communication, as a subdivision of just one branch of an organisation, would not seem helpful in presenting the organisation as an outward looking, attentive listening and actively informing entity. We clearly see a link here with our respondents generally appreciating SSM's core values, while at the same time having some doubts about its capability of effectively putting them into practice. As such, the current organisational structure could present an obstacle for SSM to effectively take up this role of ombud and to more explicitly engage in dialogue in line with the stakeholder expectations and recommendations from literature presented in this report.

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[16] Last consulted September 2024.

6. Conclusion

"Regulatory excellence requires listening attentively to changing public concerns"
(Coglianese 2020: 13)

In this report the potential was explored for SSM dialogue in the continued stepwise licensing process that lies ahead for the KBS-3 repository and related nuclear waste management activity. Our findings and recommendations are based on individual and group interviews with representatives of various concerned parties, on a quick scan of relevant (policy) documents and legislation, and on a review of scientific literature on the subject of regulatory practice.

We noticed that style matters, but that there is no one specific regulatory style in Swedish nuclear waste management. Or rather, it would seem that regulatory practice in Swedish nuclear waste management comprises of a combination of different style figures. The specific situation of a highly specialised sector with a limited amount of players and a relatively small number of people possessing relevant knowledge and skills makes 'day-to-day' regulation inevitably a rather private get-together between the regulator and a single entity to be regulated. In order to avoid this becoming or being perceived as 'black-boxed', some degree of 'artificial publicity' is needed to achieve what is recommended in literature as 'tripartism' in regulation, and to allow the issues and concerns of other parties that are neither the regulator or the regulated, but nevertheless concerned, to be taken into account. For that reason, we recommend SSM to first and foremost **develop an appropriate regulatory style for 'continued stepwise authorisation'**; to do so **by considering this as a process of 'closing up', rather than as one of mere technical fine tuning**; and **to engage all concerned in establishing which specific regulatory practices would be required,** including appropriate tools for further participation and informal dialogue.

Avoiding dialogue would not seem an option. Such dialogue must be clearly framed, delineated, and regulated, but should not be over formalised either. There appears to remain both the potential and a demand for a more formal description of SSM's responsibilities (including engagement) during the stepwise authorisation process. However, it would not be recommendable to put a sole emphasis on formal consultations surrounding this stepwise authorisation. The importance of a broader dialogue and what we have described as 'facework' should not be underestimated in striving for excellence as a trusted regulator. Participation is often (in practice and in literature) depicted as equal to taking decisions in consensus. However, that should not be the aim in regulatory practice, and this did not seem to be what our respondents had in mind either. The primary goal of dialogue with the regulator appears for most concerned parties to be about being attentive to various concerns in society, about getting to know and understand each other, and to build up a relationship. Acknowledging that different framings exist and taking them into account (rather than disregard them) does not mean agreeing with them. Likewise, paying attention to informal contacts and making considerations and judgements outside of the formal process does not mean negotiating your position with others.

It seems important to stress that integrating participation and dialogue in the regulatory approach for the continued stepwise authorisation process should **neither push, nor stall implementation**. The further implementation of the KBS-3 project is inevitably a predominantly local affair, but also undeniably one of national concern and importance, and potentially impacted by policy decisions at that level (e.g. nuclear new build). These

should not be seen as mutually exclusive and should each be given proper attention. Hence the emphasis on understanding the **continued stepwise authorisation process as a way of 'closing up'**, and the recommendation to include in the process design an arena or arenas to deal with remaining and emerging issues, thus assuring the 'up'.

Clear expectations from stakeholders vis-à-vis SSM that provide good leads for taking dialogue forward, are:

- a request for more (pro)active communication and not limiting sharing of opinions to formal statements at formal occasions;
- the expressed hope by local community representatives, local authorities and NGOs of having a good relationship and regular contact with the regulator, e.g. through the (re)installation of a stakeholder liaison officer or contact point; and
- an emphasis on the regulator's role as the people's expert and as ombud, an organisation that is there to help others understand and to answer questions and concerns from various people and organisations.

These expectations fall clearly within what scientific literature describes as **the role of a regulator in a democratic society**, namely **to act in the 'general interest', and to combine a neutral and factual position on the one hand, with an engaging and receptive attitude towards a diverging range of stakeholders on the other hand**.

Striving for regulatory excellence requires not only technical excellence and legal expertise within the field of competence. It also requires what Coglianese (2016, 2020) refers to as *"people excellence"*, focussing on aspects such as openness, empathy, humility and trustworthiness. A stronger emphasis than would seem to be the case today will be needed on listening, on communicating in an understandable way (not too technical, yet informative enough for those with an interest), and on facework.

Before opening up this dialogue (first on modalities and second as part of the continued review process and a means of 'closing-up'), SSM should make clear for itself to what extent it can (both legally and practically) meet the expectations raised by various stakeholders documented in this report. **An introspective exercise to set the mind of the organisation on dialogue is deemed useful**. Questions to be answered in this regard are, among others:

- How to enact fully our core values?
- How to organise closing-up in practice?
- Do current organisational structure and competences within the organisation match future needs?
- Is SSM capable of incorporating social aspects and stakeholder relations within the organisation or is outside help, and in what form, needed?
- Should SSM be the one to organise the closing-up, or does this require a dedicated body?

When decided on the organisation of dialogue (or dialogues) within the context of the continued stepwise authorisation process, it is important to clearly communicate what SSM expects from this, and what stakeholders can expect from SSM.

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8. Appendices

Annex 1: Interview Protocol Swedish Stakeholders

PART 1 – INTRODUCTION
This Project has been funded by SSM to assist this regulatory authority in developing appropriate forms of dialogue and consultation during the construction and operation of facilities related to the final disposal of nuclear waste and spent fuel. You are invited because you are a main stakeholder, you are knowledgeable about the topic, live in the area, etc.

- Introduction of participants
- Focus group objective: we have asked you to participate in this 90 minutes group discussion to share your thoughts, opinions and answer some questions on the relationship between the authority (SSM) and your organisation
- Focus group rules
  - One person talks at a time, we are recording
  - Everyone's ideas will be respected and we listen respectfully to others
  - Everyone has the right to talk and everybody has the right to pass on a question
  - There are no right or wrong answers, only differing points of view
  - The role of the facilitator is to guide the discussion
- The information we gather is confidential and no names will be used (no individual names or identifying information will be attached to comments). We record the meeting for our own research purpose.
- In confirming your attendance to this meeting via e-mail, you have expressed your consent to participate in this study, and to respect the confidentiality rules regarding any information obtained during this session (Chatham House Rule). Regarding the former, you have at all times the right to withdraw and instruct us not to use your responses any longer for this study. You can do so by e-mail to anne.bergmans@uantwerpen.be (please make sure to ask for confirmation of receipt).

PART 2 – GUIDING QUESTIONS
To be adapted depending on the interviewee/participants in the focus group.
Optional: use 'padlet' (online post-its) to collect first individual responses (particularly for the 4th and 5th set of questions) which are then discussed further
The focus of this study is, as indicated just now, to find out in what way SSM should and could pay more attention to dialogue and consultation specifically during the construction and operation of facilities related to the final disposal of nuclear waste and spent fuel, but we would like to extent this to radioactive waste management facilities in general. If you have a particular opinion regarding any other actors involved, or regarding the current situation in the attempts for licensing KBS-3 or the extension of SFR, you are welcome to do so. However, please only do so if you feel this is important for us to know in order to understand your position vis-à-vis SSM. It is not the purpose if this focus group the ins-and-outs of any of those disposal projects as such.

- How have you / has your organisation been involved in the repository programme over the years?
- **What** in general do you think is the role of the regulator in the repository programme? To what extent are dialogue and consultation important features in a regulator's mission statement?

- This is not an overall evaluation of SSM. We are looking for expectations and good practices with regard to stakeholder engagement. In that respect …
    o How would you describe your relationship with SSM today? To what extent is this different from your relationship with other key stakeholders? (is that ok, or would you prefer it to be different, and in what way)
    o Has there been an evolution in this relationship over time – and in what respect?
    o What do you see as **good practices** in the **dialogue** between your organisation and SSM **so far**? What about other organisations/stakeholders?
    o Which of these are applicable also in **future** or what changes/improvements you think are needed?

- How do you envisage the governance process of implementing KBS-3 or the extension of SFR in general?
    o Is this straight forward and clearly set out or is that still open?
- What role would you like for your organisation in this? Is this role currently guaranteed? (If so, how? If not, what could help to change that?)

- As part of that governance process, what are your **expectations** regarding dialogue and engagement specifically with SSM during the construction and operation of the repository?

- Do you have any particular **concerns** regarding the dialogue and engagement with SSM during the construction and operation of the repository?

- Of all the things we've talked about, what is **most important** to you/your organisation?
- Who are **other key stakeholders** in this future process and in what capacity? Do you have an opinion on their relation vis-à-vis the regulator?

- Anything else you want to share that we haven't talked about yet? Expectations regarding this session that we didn't meet?

PART 3 – CLOSURE
Thank the participants, give them contact information for further follow up. Explicitly mention that if they think of anything else to mention later on, we welcome their additional input.
Tell participants about the next steps: we will analyse the data and share it with them for validation/clarification.

Annex 2: Interview Protocol other Regulators

To what extent do you consider dialogue and consultation important features in a regulator's mission statement? How is this in your country?

Is the role of the regulatory authority with regards to stakeholder dialogue foreseen or taken into account in the legal framework of your country?

[From your experience (or in anticipation)] Do you see a change in the role of the regulatory authority with regards to stakeholder dialogue between the siting and licensing process on the one hand and the construction and operation of nuclear waste facilities on the other hand? Please explain either way?

What do you think are expectations of stakeholder groups [again from direct experience or knowledge of similar cases] vis-à-vis regulatory authorities regarding dialogue during the construction and operation of RWM facilities in your country?

How would you describe your relationship with various stakeholder groups in relation to nuclear waste facilities? Are you happy with this situation, or do you see room for improvement ? How do you plan to organise dialogue in the future?

Any good practices or recommendations to be considered?

Of all the things we've talked about, what is most important from your perspective?

Anything else you want to share that we haven't talked about yet? Expectations regarding this session that we didn't meet?

Annex 3: Jointness and Voluntariness as Distinguishing Features between Regulatory Approaches

The table presented here is based on Mol, Lauber & Liefferink (2000: 4 - fig. 1.1). It distinguishes regulatory systems in view of their level of

- Jointness (Axe X): High vs low public-private interaction
  and
- Voluntariness (Axe Y): Obligatory vs voluntary

	High public-private interaction		
Obligatory	Regulation by consensus seeking Negotiated rule-making	Joint environmental policy making	Voluntary
	Command-and-control Regulation imposed unilaterally	Self-regulation	
	Low public-private interaction		

Annex 4: Ortwin Renn's Four Policy Styles for Regulation

The table below we have reproduced from Renn 2000: 408 - Table I, and shows the main features of the four regulatory policy-making styles he puts forward

| Style	Characteristics	Role of scientific expertise
Adversarial approach	Open to professional and public scrutiny Need for scientific justification of policy selection Precise procedural rules Oriented toward producing evidence	Main emphasis on scientific evidence and pragmatic knowledge Integration of adversarial positions through formal rules (due process) Little emphasis on personal judgment and reflection on the side of scientists Contingent on claims of methodological objectivity
Fiduciary approach (patronage)	Closed circle of "patrons" No public control, but public input Hardly any procedural rules Oriented toward producing faith in the system	Main emphasis on enlightenment and background knowledge Strong reliance on institutional in-house "expertise" Based on bureaucratic efficiency Contingent on personal relationships
Consensual approach	Open to members of the "club" Negotiations behind closed doors Flexible procedural rules Oriented toward producing solidarity with the club	Main emphasis on (scientific) reputation Strong reliance on expert judgment (also nonscientific experts) Main emphasis on positive attitude Contingent on social status and political position
Corporatist approach	Open to interest groups and experts Limited public control, but high visibility Strict procedural rules outside of negotiating table Oriented toward sustaining trust to the decision-making body	Main emphasis on expert judgment and political prudence Strong reliance on impartiality of experts Integration by bargaining within scientifically determined limits Contingent on senior status within science communities

Annex 5: Organisation Chart of SSM
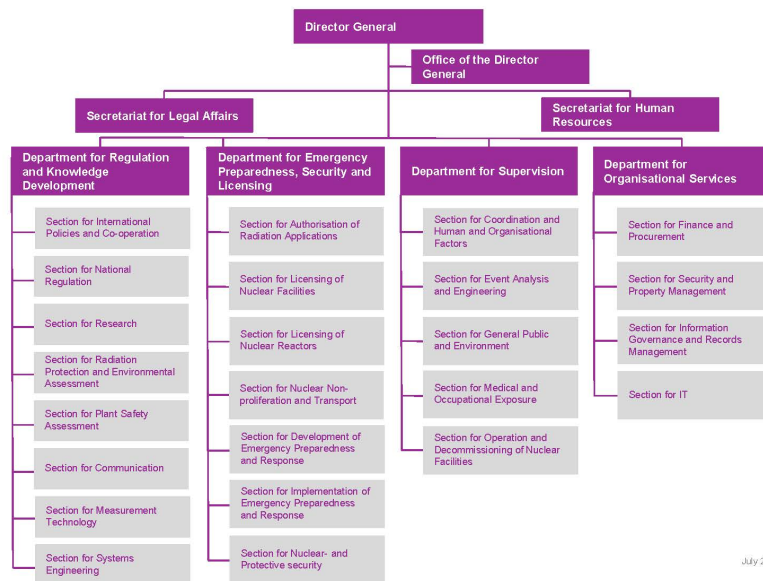
Figure 2: Organisation Chart SSM – July 2024 (source: SSM – About the Authority)

The Swedish Radiation Safety Authority (SSM) works proactively and preventively with nuclear safety, radiation protection, nuclear security, and nuclear non-proliferation to protect people and the environment from the harmful effects of radiation, now and in the future.