

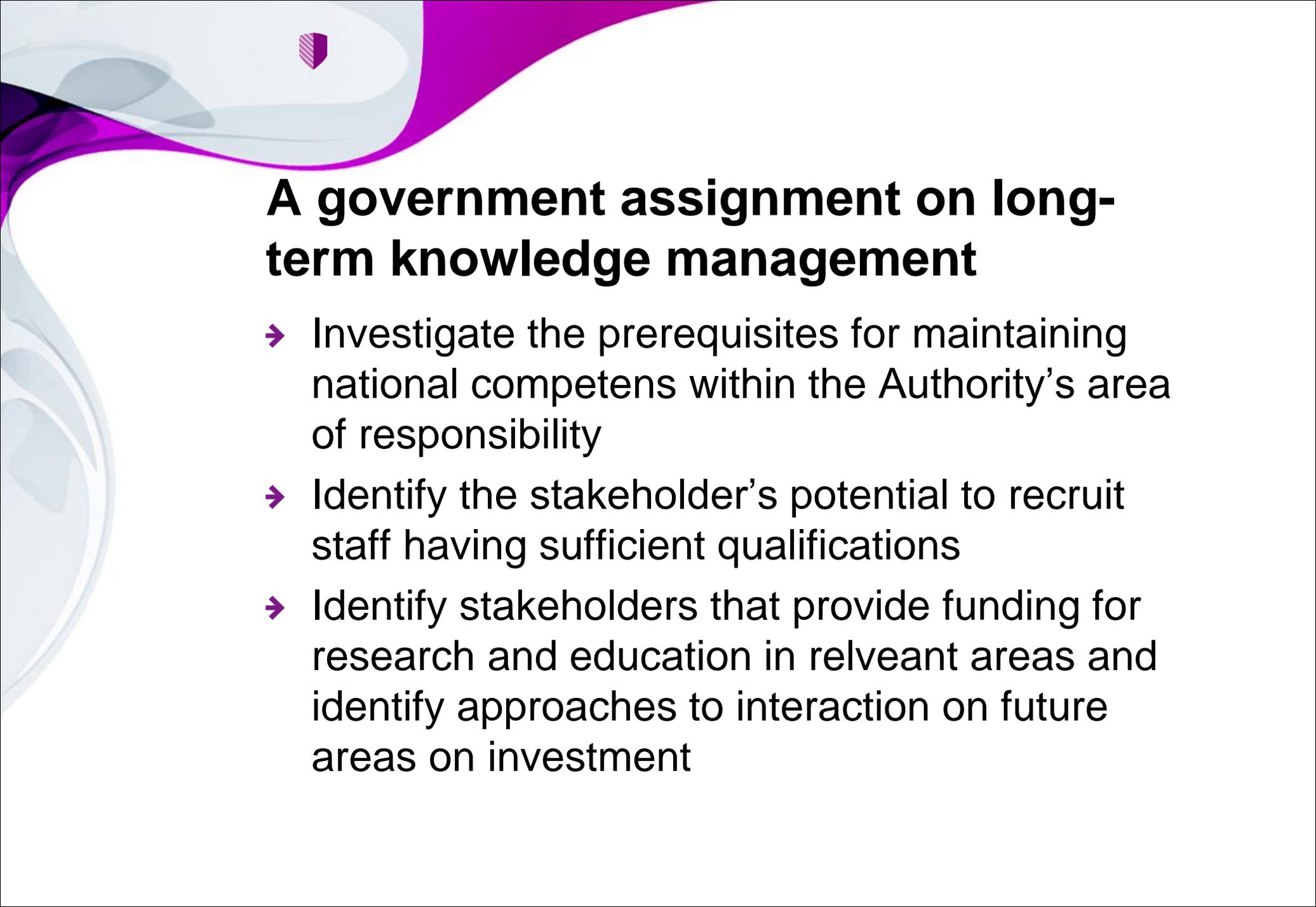


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Swedish Radiation Safety Authority

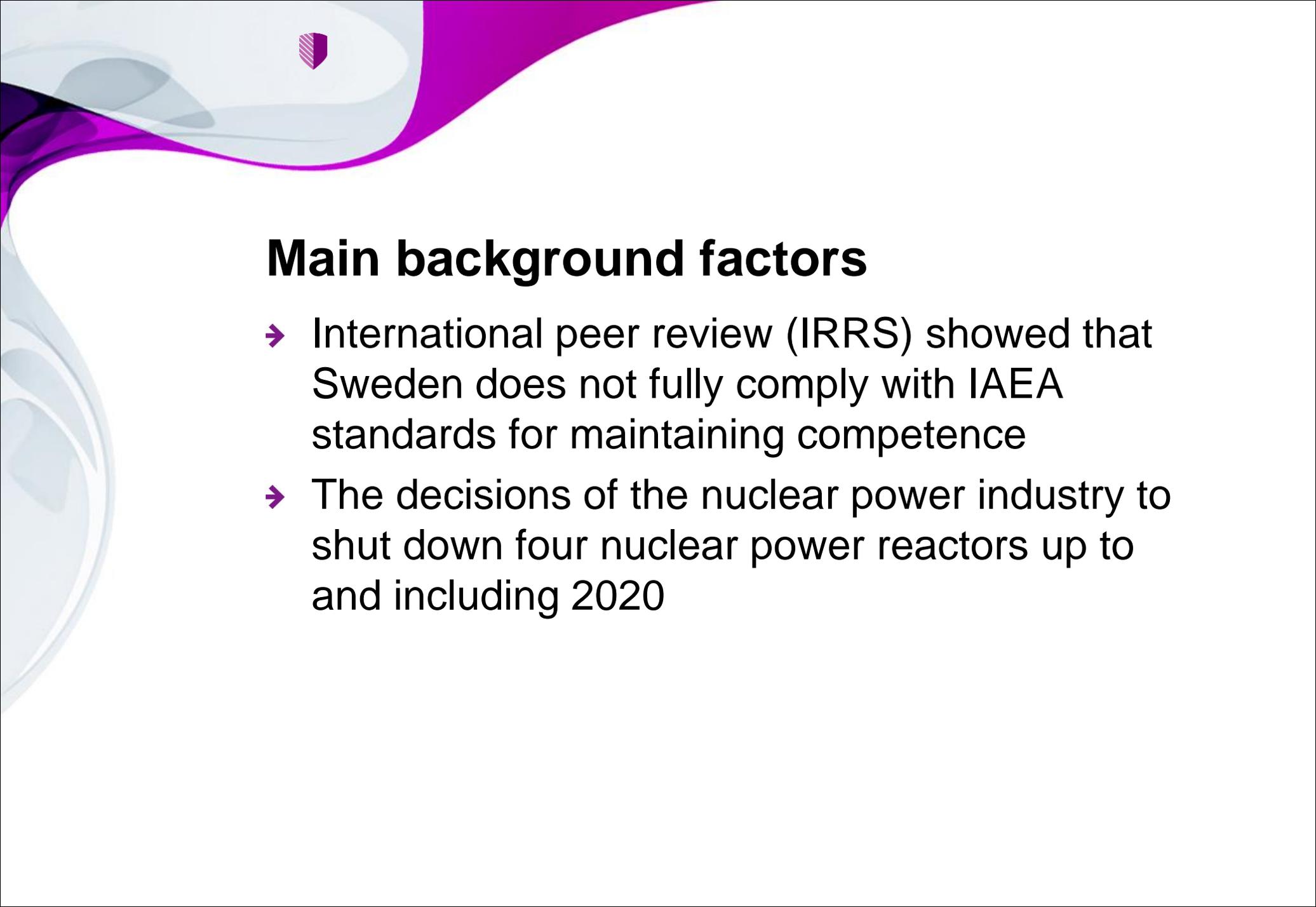
HOW TO SECURE COMPETENCE IN RADIATION SAFETY?

SSM:s view concerning Sweden



A government assignment on long-term knowledge management

- ➔ Investigate the prerequisites for maintaining national competens within the Authority's area of responsibility
- ➔ Identify the stakeholder's potential to recruit staff having sufficient qualifications
- ➔ Identify stakeholders that provide funding for research and education in relveant areas and identify approaches to interaction on future areas on investment



Main background factors

- International peer review (IRRS) showed that Sweden does not fully comply with IAEA standards for maintaining competence
- The decisions of the nuclear power industry to shut down four nuclear power reactors up to and including 2020



A national framework for knowledge management

- Universities educates students, and provide funding for researchers
- Dynamic research environments provide knowledge, and contribute to high quality education
- Students are attracted to higher education and can foresee being employed
- Employers recruit educated people
 - Internal training and deepened competence



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About the investigation



Three perspectives investigated

- ➔ Employers' needs of competence
 - Shapes the needs of the national system for knowledge management
- ➔ Universities' programmes
- ➔ Society's need for scientific expertise



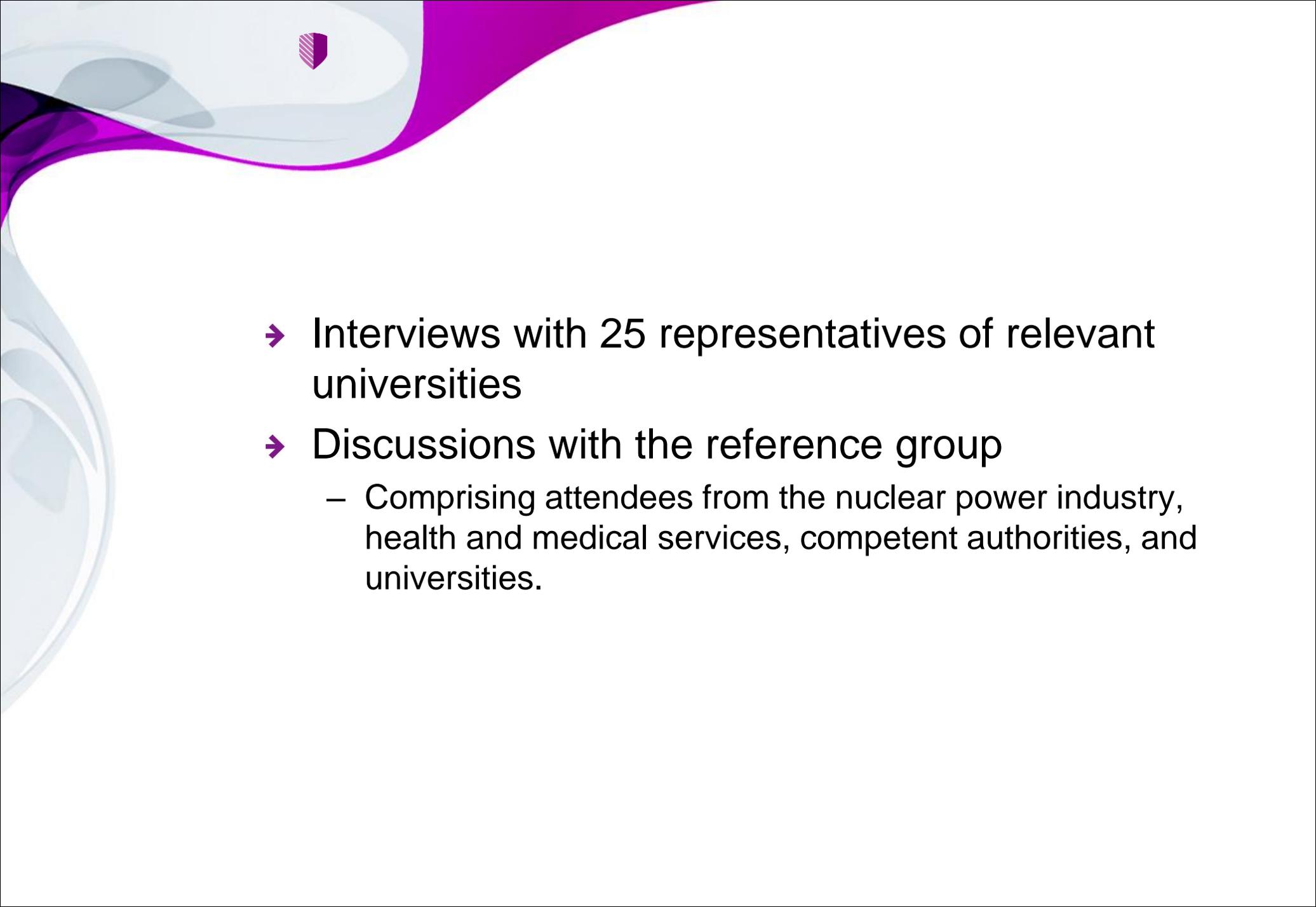
Four sectors

- ➔ Nuclear power sector
- ➔ Other industrial applications
- ➔ Care activities
- ➔ Government authorities



The data compiled included

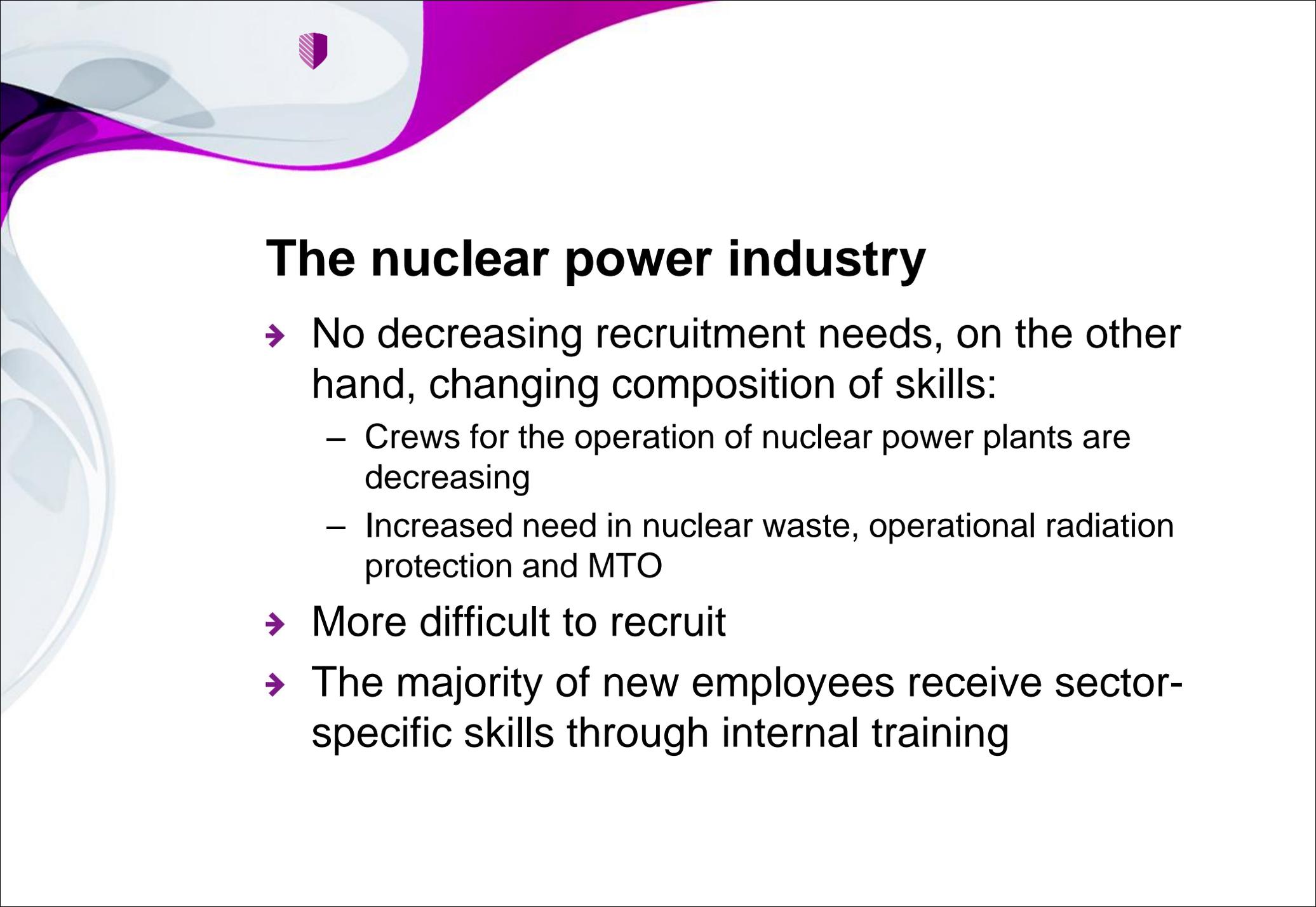
- ➔ SSM:s former government assignments regarding knowledge management
- ➔ Professional skills assessments carried out by the major licensees of nuclear facilities
- ➔ Statistical data on employee competence
- ➔ Questionnaire responses from approximately 2,000 licensees

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- ➔ Interviews with 25 representatives of relevant universities
 - ➔ Discussions with the reference group
 - Comprising attendees from the nuclear power industry, health and medical services, competent authorities, and universities.



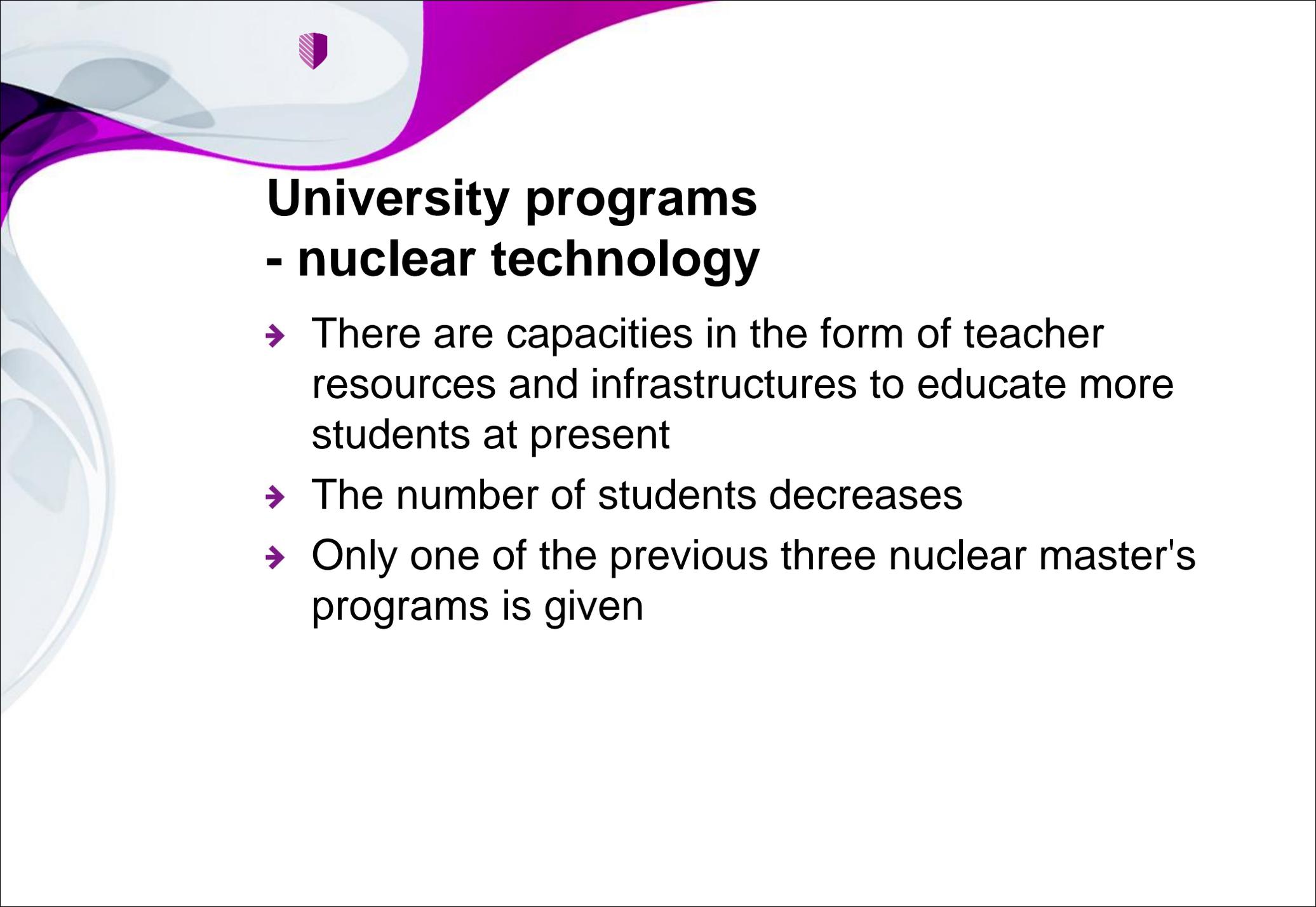
Results

Short version, nuclear power sector



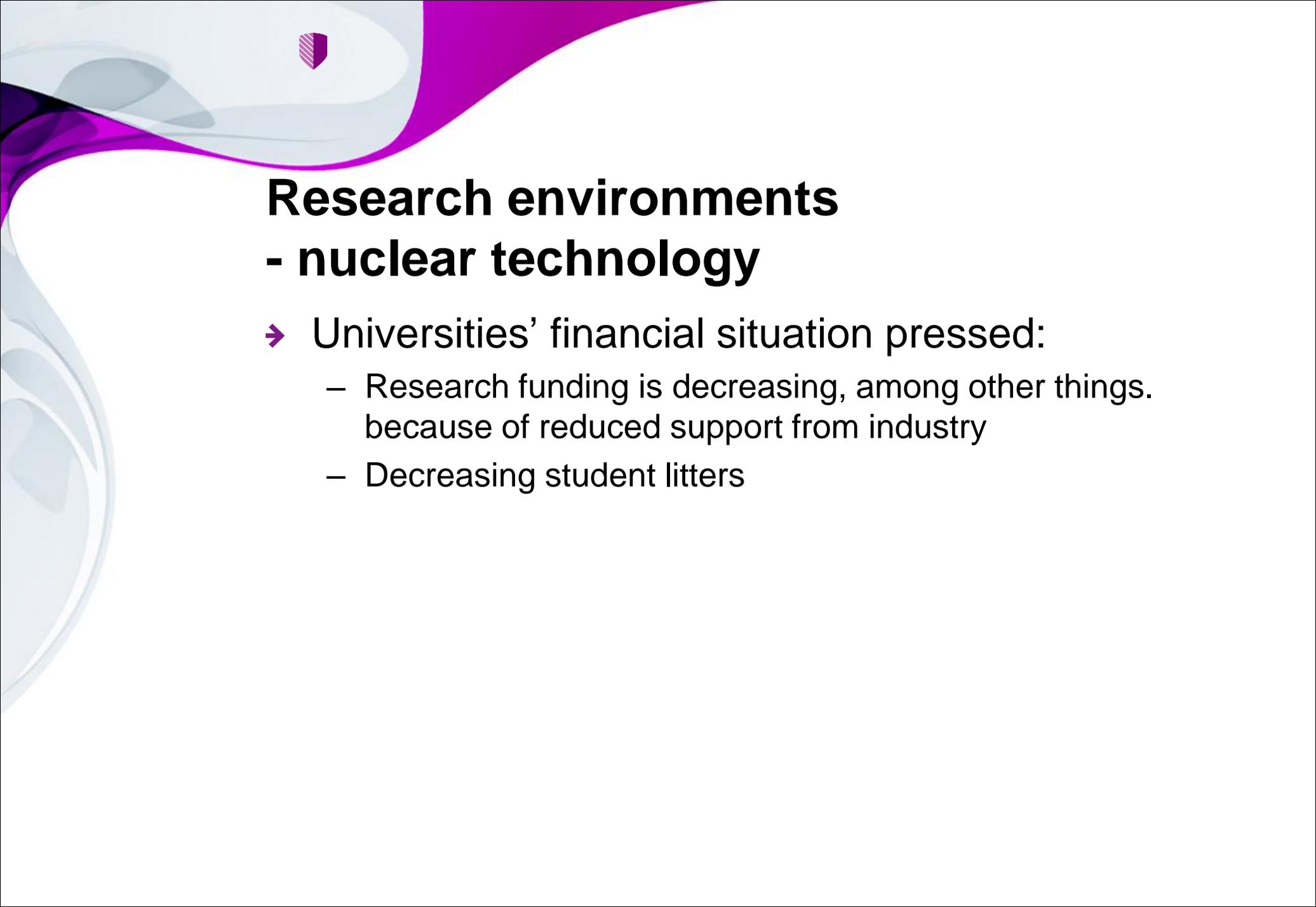
The nuclear power industry

- No decreasing recruitment needs, on the other hand, changing composition of skills:
 - Crews for the operation of nuclear power plants are decreasing
 - Increased need in nuclear waste, operational radiation protection and MTO
- More difficult to recruit
- The majority of new employees receive sector-specific skills through internal training



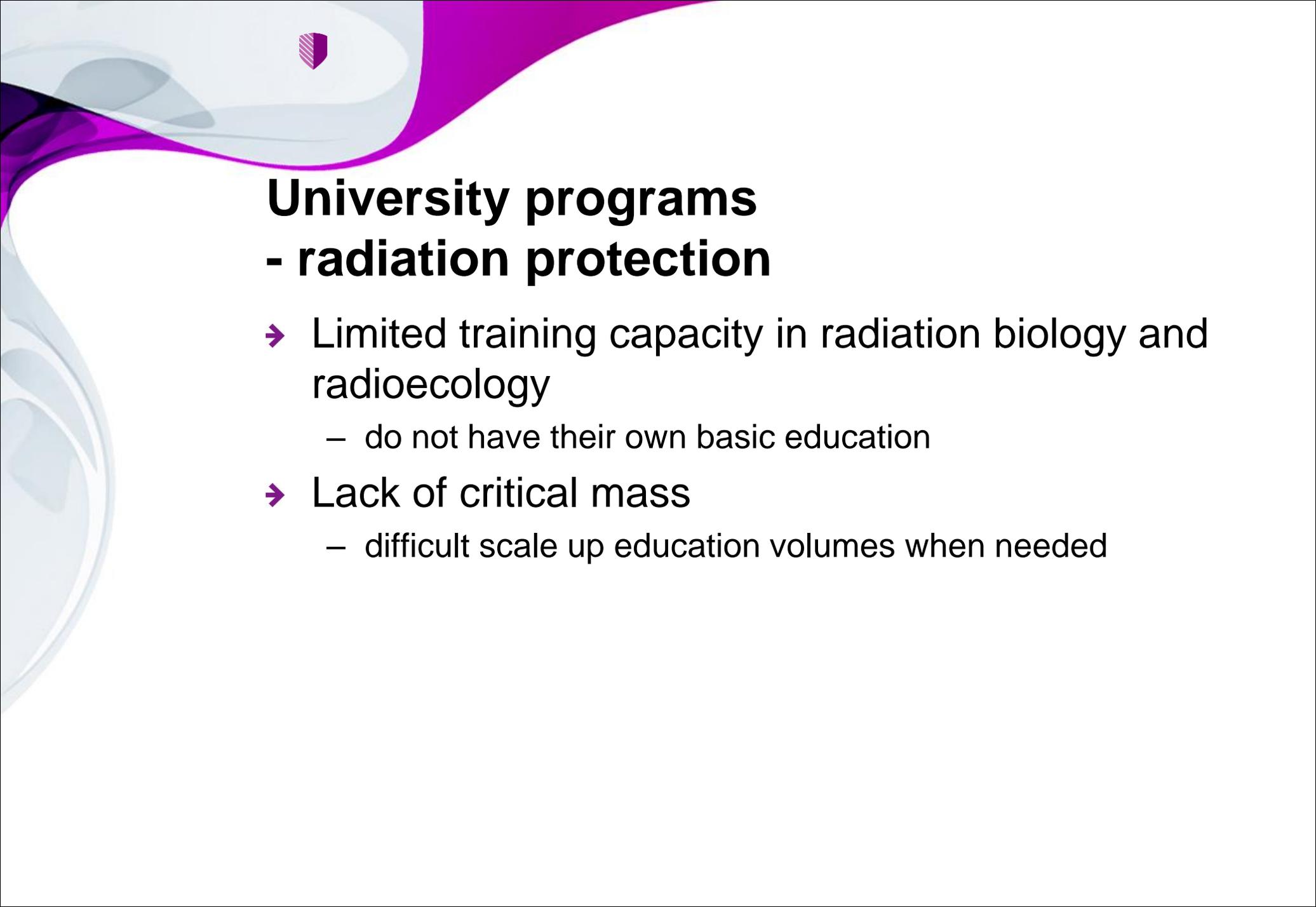
University programs - nuclear technology

- ➔ There are capacities in the form of teacher resources and infrastructures to educate more students at present
- ➔ The number of students decreases
- ➔ Only one of the previous three nuclear master's programs is given



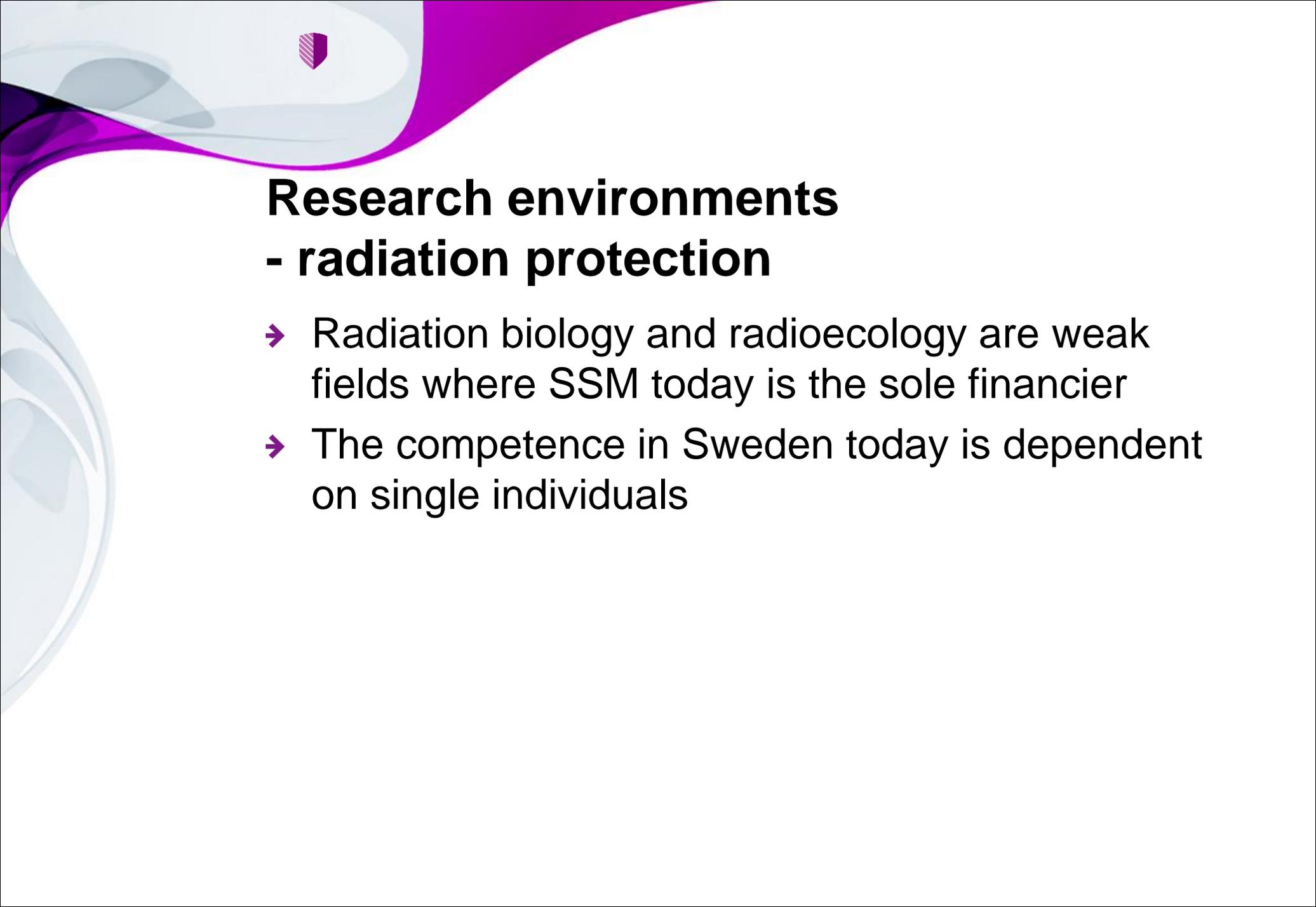
Research environments - nuclear technology

- ➔ Universities' financial situation pressed:
 - Research funding is decreasing, among other things. because of reduced support from industry
 - Decreasing student numbers



University programs - radiation protection

- ➔ Limited training capacity in radiation biology and radioecology
 - do not have their own basic education
- ➔ Lack of critical mass
 - difficult scale up education volumes when needed



Research environments - radiation protection

- Radiation biology and radioecology are weak fields where SSM today is the sole financier
- The competence in Sweden today is dependent on single individuals



Analysis



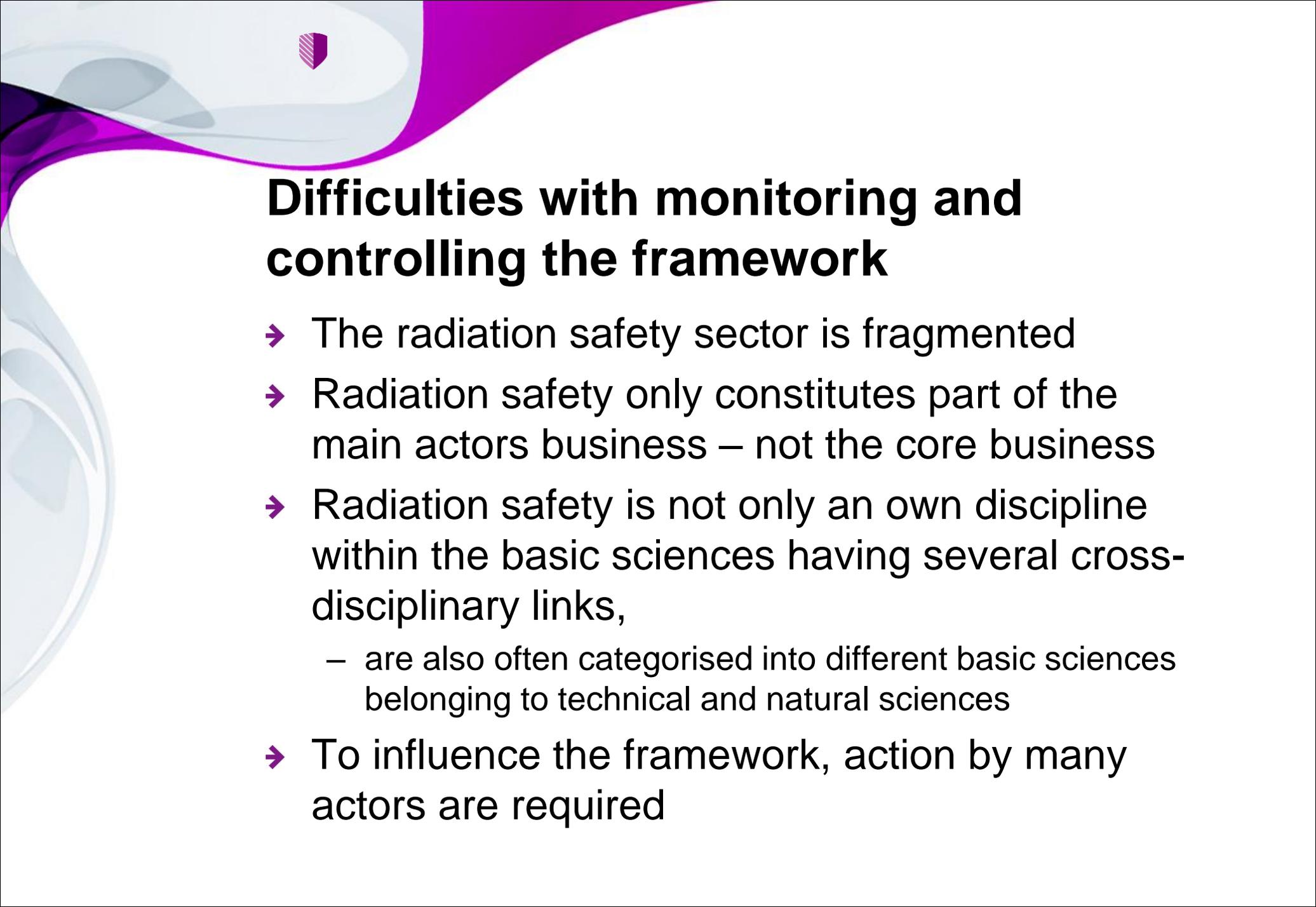
Conclusions

- ➔ There is a need to strengthen the national framework for knowledge management in areas relating to radiation safety
 - Energy agreement on a political level signifies that the nuclear power sector will need long-term knowledge management



Present underfunding of several areas of research critical to society

- ➔ Certain radiation safety competences are needed primarily for major radiological accidents
- ➔ Research is not considered scientifically interesting by the major research financiers
- ➔ The nuclear power industry reduced its research budget due to financial pressure



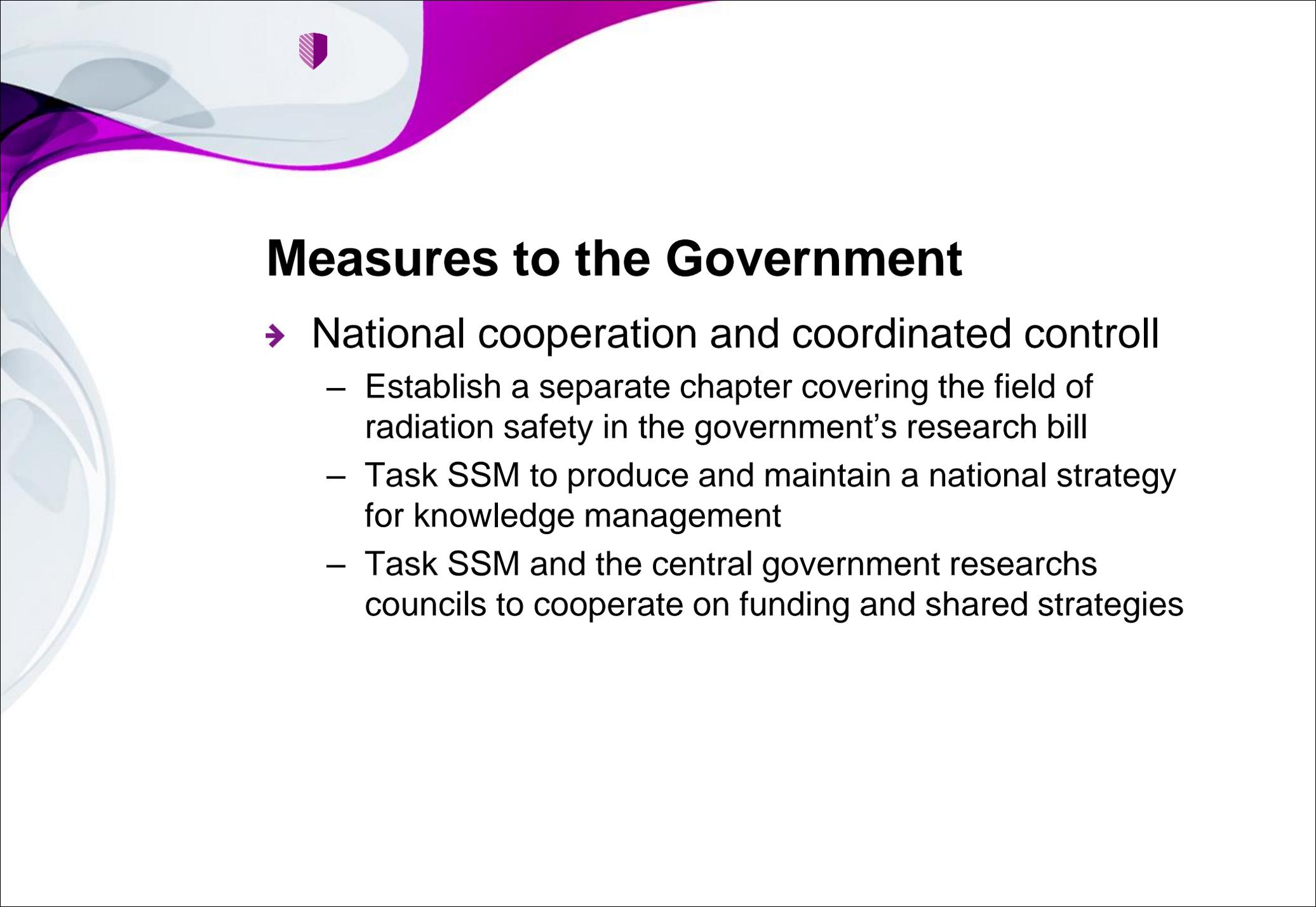
Difficulties with monitoring and controlling the framework

- The radiation safety sector is fragmented
- Radiation safety only constitutes part of the main actors business – not the core business
- Radiation safety is not only an own discipline within the basic sciences having several cross-disciplinary links,
 - are also often categorised into different basic sciences belonging to technical and natural sciences
- To influence the framework, action by many actors are required



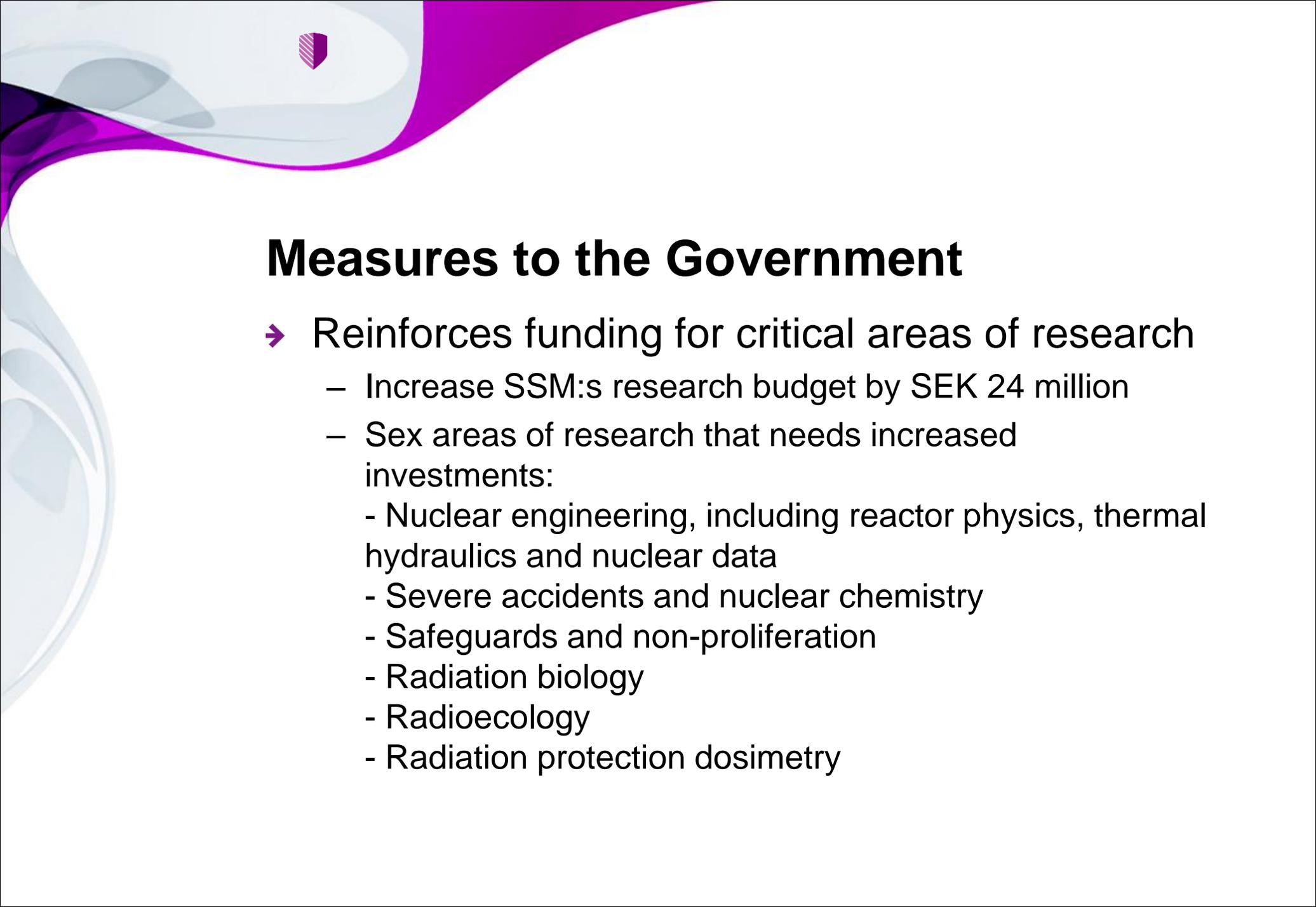
Measures proposed

- 11 measures proposed to the Swedish Government
- 6 measures that SSM can carry out
- 2 recommendations to the licensees



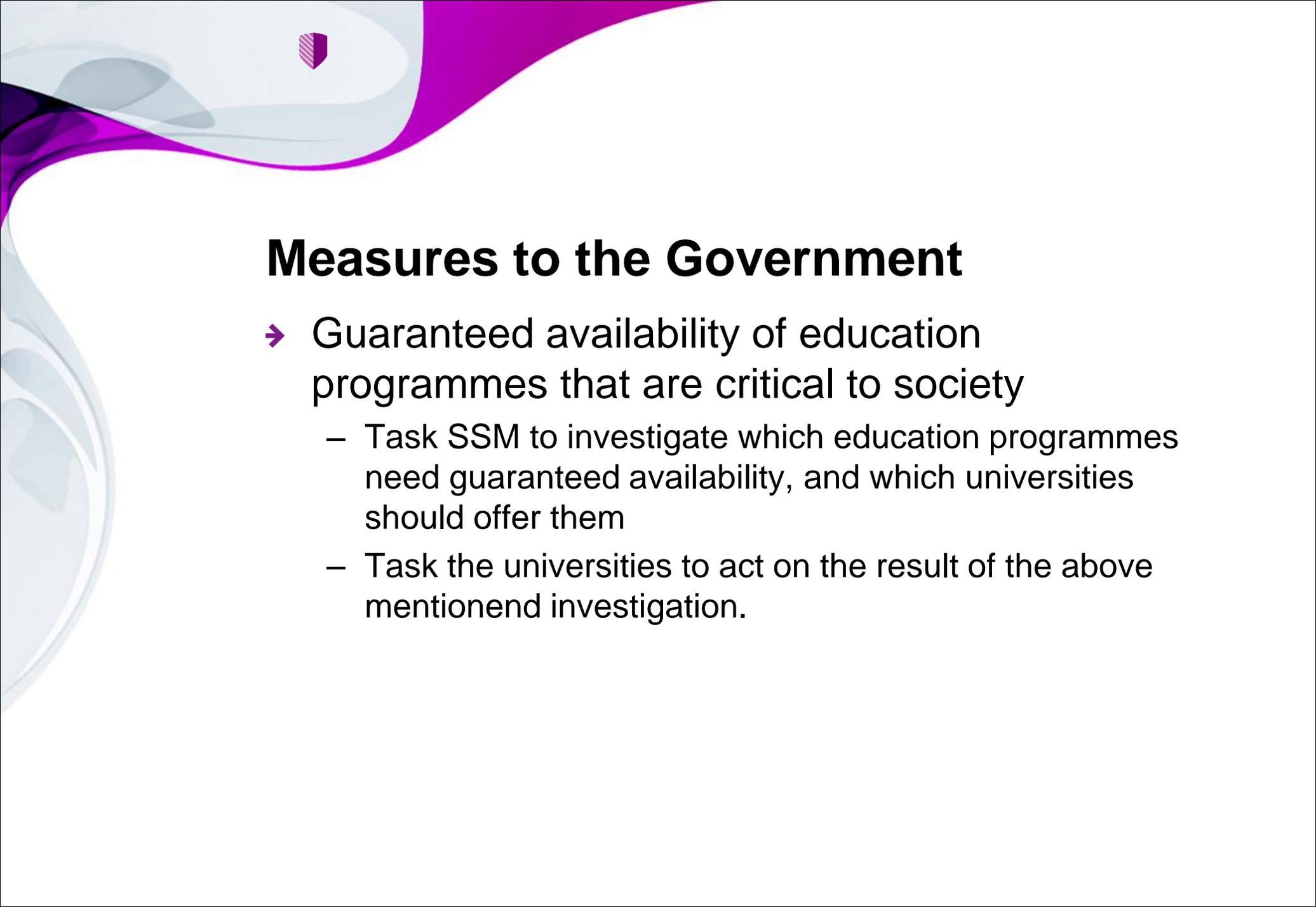
Measures to the Government

- ➔ National cooperation and coordinated control
 - Establish a separate chapter covering the field of radiation safety in the government's research bill
 - Task SSM to produce and maintain a national strategy for knowledge management
 - Task SSM and the central government researchs councils to cooperate on funding and shared strategies



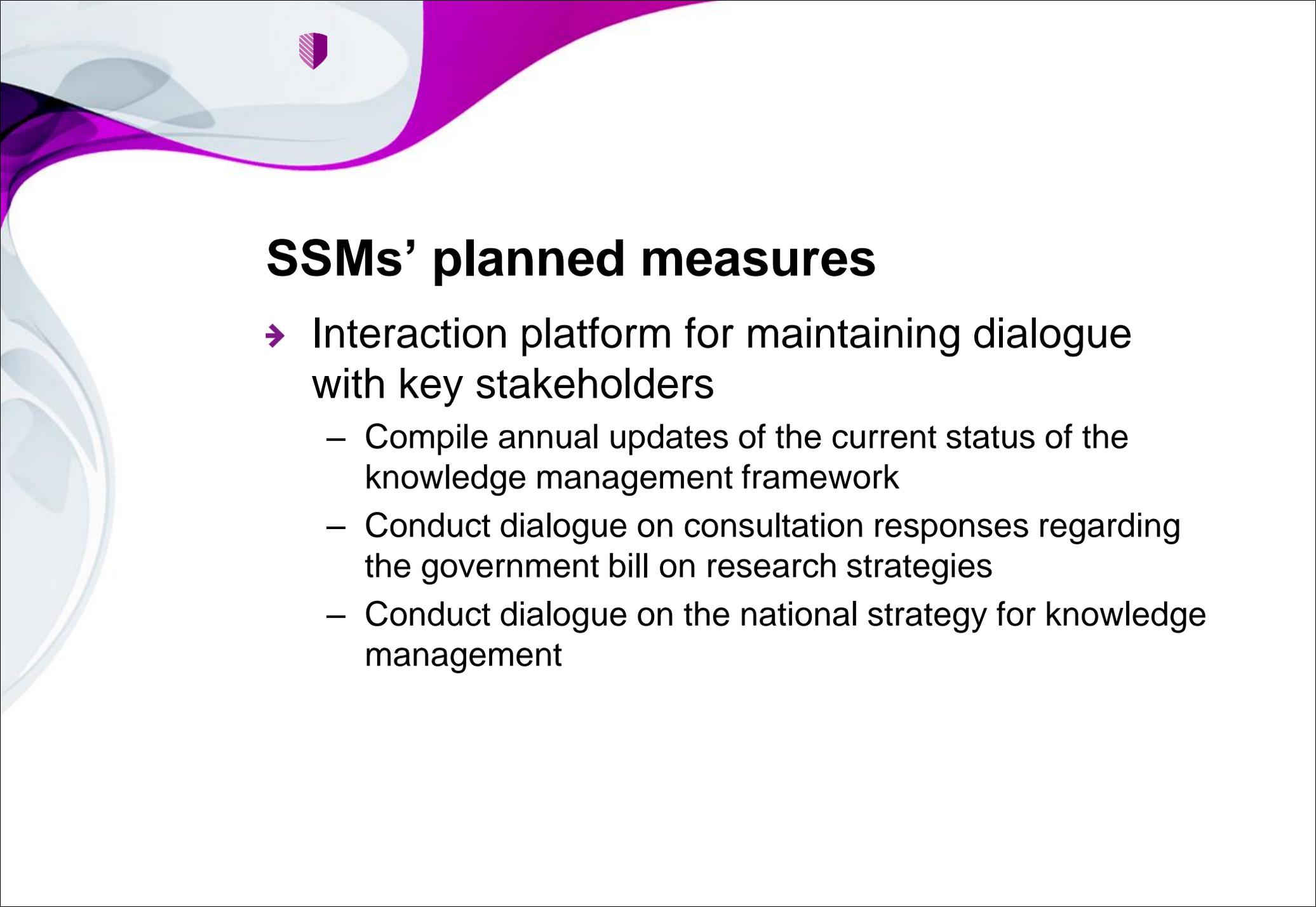
Measures to the Government

- ➔ Reinforces funding for critical areas of research
 - Increase SSM:s research budget by SEK 24 million
 - Sex areas of research that needs increased investments:
 - Nuclear engineering, including reactor physics, thermal hydraulics and nuclear data
 - Severe accidents and nuclear chemistry
 - Safeguards and non-proliferation
 - Radiation biology
 - Radioecology
 - Radiation protection dosimetry



Measures to the Government

- ➔ Guaranteed availability of education programmes that are critical to society
 - Task SSM to investigate which education programmes need guaranteed availability, and which universities should offer them
 - Task the universities to act on the result of the above mentioned investigation.



SSMs' planned measures

- ➔ Interaction platform for maintaining dialogue with key stakeholders
 - Compile annual updates of the current status of the knowledge management framework
 - Conduct dialogue on consultation responses regarding the government bill on research strategies
 - Conduct dialogue on the national strategy for knowledge management



Recommendations for licensees

- ➔ Licensees should run campaigns to increase the attractiveness of jobs in the sector
- ➔ Licensees should continue to develop opportunities for relevant employees to maintain and develop in-depth skills



Changes since september 2018

Industry

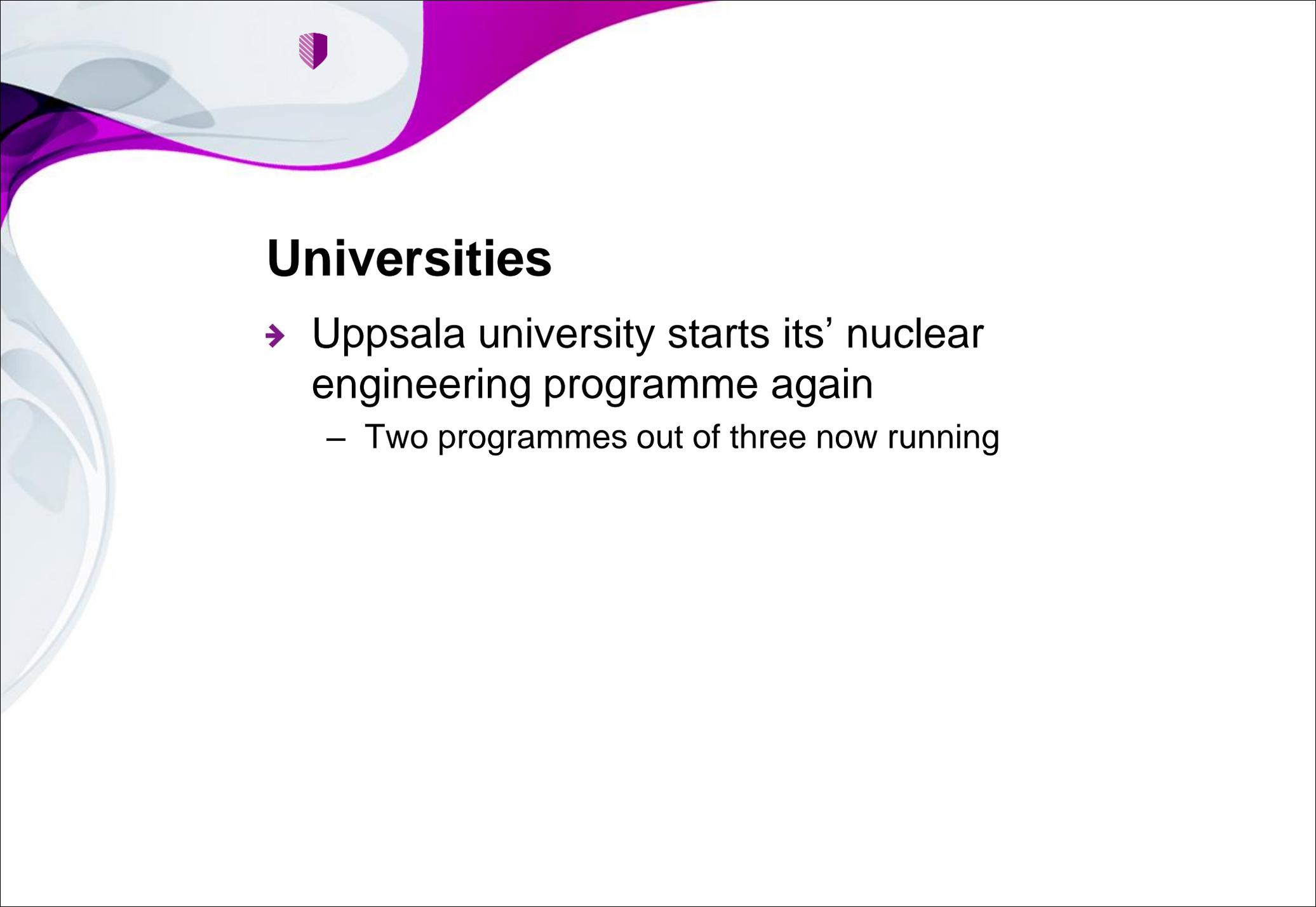
Universities

SSM



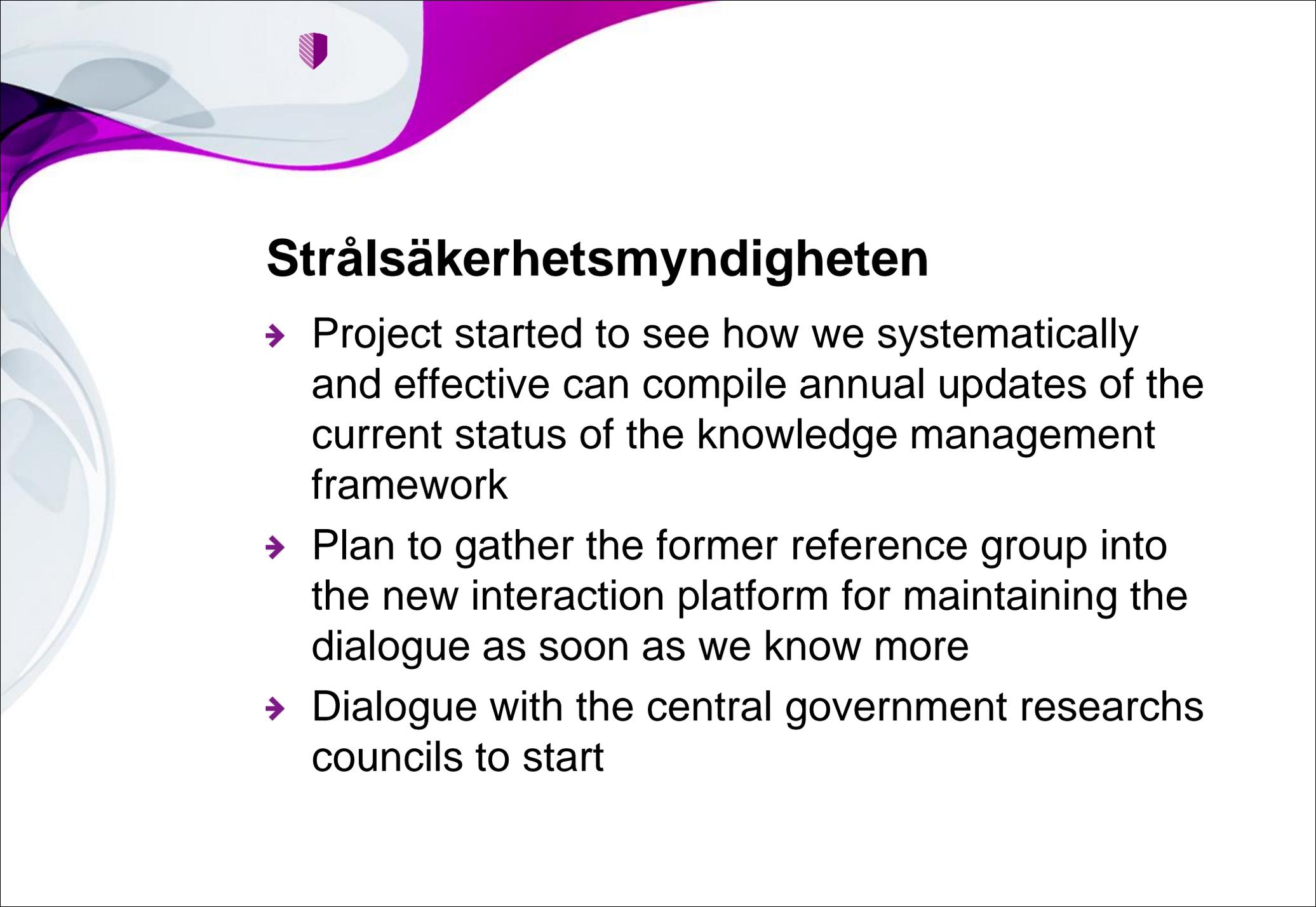
Nuclear power industry

- Recruitment campaigns
 - It is possible to recruit, but the cost is higher
- Vattenfall, Uniper in Sweden and TVO in Finland: establishing a network for future competence supply, where advanced engineering expertise becomes available as a flexible resource.



Universities

- ➔ Uppsala university starts its' nuclear engineering programme again
 - Two programmes out of three now running



Strålsäkerhetsmyndigheten

- Project started to see how we systematically and effectively can compile annual updates of the current status of the knowledge management framework
- Plan to gather the former reference group into the new interaction platform for maintaining the dialogue as soon as we know more
- Dialogue with the central government research councils to start



Government's measures

- ➔ To be continued when a new government is established