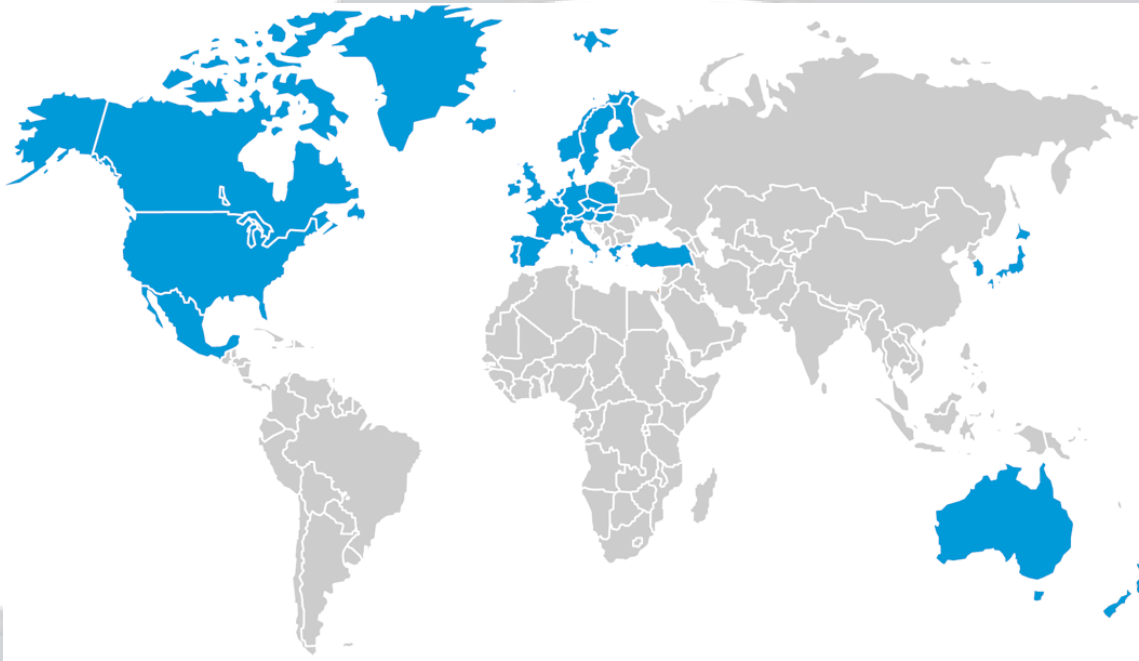


4th International Conference on Education and Training in Radiological Protection

NEA Study on Maintaining Qualified Human Resources

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OECD Membership



**30 OECD
member countries:**

- ▶ The 15 EU members before recent enlargement.
- ▶ Czech Republic, Hungary, **Poland** and the Slovak Republic
- ▶ Switzerland, Norway, Iceland and Turkey.
- ▶ The United States, Canada and Mexico.
- ▶ Japan, Korea, Australia and **New Zealand**.

Not NEA member countries

The NEA Mission

- ▶ To assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes.
- ▶ To provide authoritative assessments and to forge common understandings on key issues, as input to government decisions on nuclear energy policy, and to broader OECD policy analyses in areas such as energy and sustainable development.

Competence: a NEA Cause of Concern

- ▶ Nuclear Energy Outlook (2008)
- ▶ Radiation Protection in Today's World: Towards Sustainability (2007)
- ▶ Joint CSNI/CNRA Strategic Plan and Mandates (2005)
- ▶ CRPPH Sponsored Survey of University-Level Education Programmes in Radiation Protection (1996, 2001, 2005)
- ▶ Collective Statement Concerning Nuclear Safety Research (2004)
- ▶ Nuclear Competence Building (NEA 2004)
- ▶ Assuring Future Nuclear Safety Competencies: Specific Actions (2001)
- ▶ Nuclear Education and Training: Cause for Concern (2000)
- ▶ Radiation Protection Today and Tomorrow (1994)

Recent NEA Position

Statement by the NEA Steering Committee for Nuclear Energy regarding a government role in ensuring qualified human resources in the nuclear field.

18 October 2007

<http://www.nea.fr/html/general/press/2007/>

Steering Committee 2007 Statement

Given that availability of qualified human resources is a prerequisite, *inter alia*, to the safe operation of existing nuclear power plants as well as to recourse to nuclear energy in general, the OECD Steering Committee for Nuclear Energy has agreed to convey to its members governments the following statements:

- ▶ Governments should regularly carry out assessments of both requirements for, and availability of, qualified human resources to match identified needs.
- ▶ Governments, academia, industry and research organisations should collaborate both nationally and internationally to enhance nuclear education and availability of nuclear expertise, including financial support to universities and scholarships to students.
- ▶ Governments, whether or not they choose to utilise nuclear power, should also encourage large, high-profile, international R&D programmes which attract students and young professionals to become the nuclear experts required for the future.

NEA/SC 2007 Key Issues

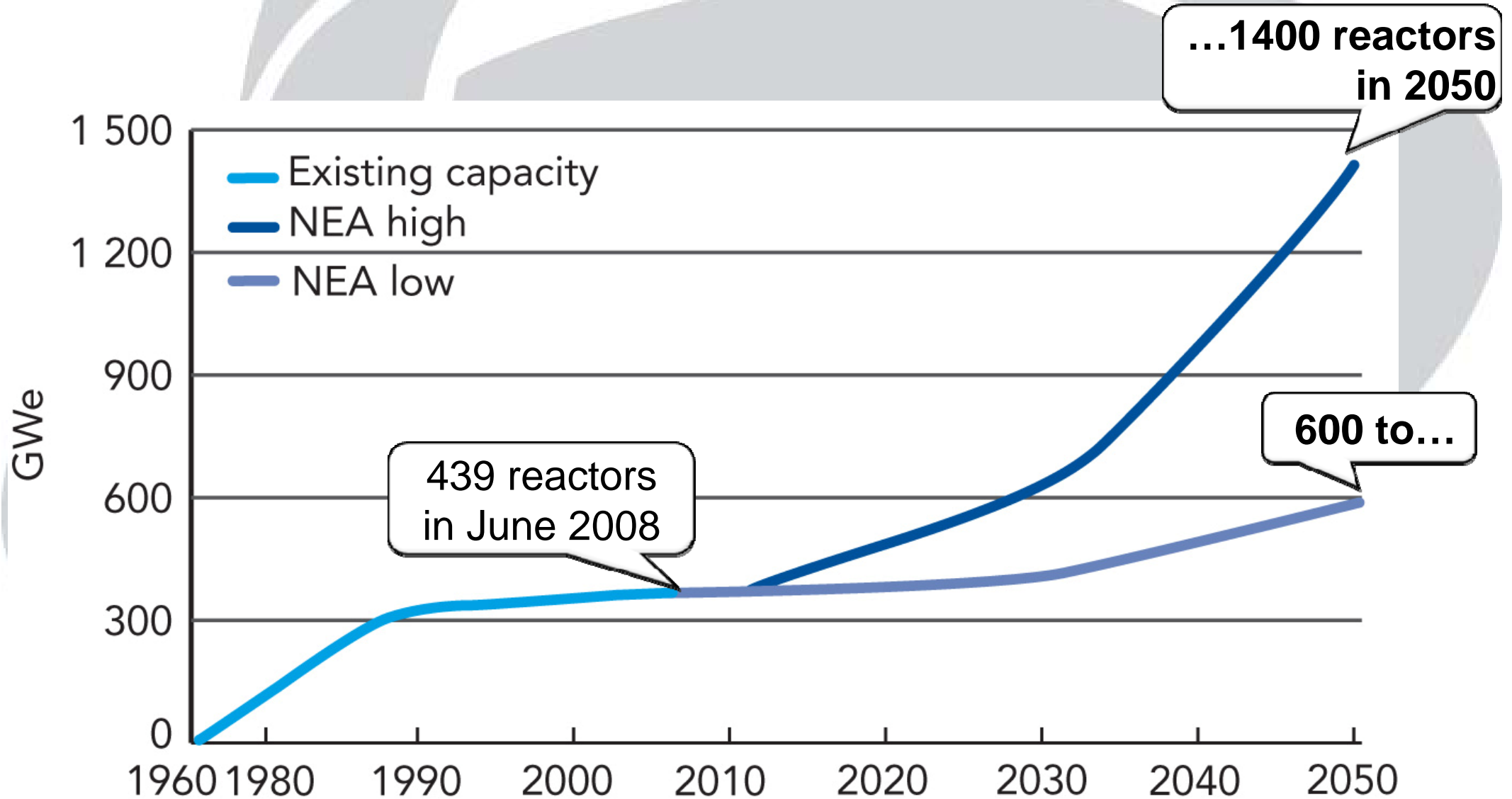
Due to long timescales and requisite technical competence, the nuclear sector is now facing 3 problems:

- ▶ **How to retain existing skills and competences** for the long period during which a plant is operating, especially when facilities in that country may be near the end of the life cycle and no additional facilities are foreseen in the near future.
- ▶ **How to develop and retain new skills and competences** in areas such as decommissioning and radioactive waste management, which may be viewed as “sunset” activities and therefore unattractive to young people.
- ▶ **How to support a revival of nuclear power** in countries with an ageing workforce and declining programmes?

Estimation of Future Needs

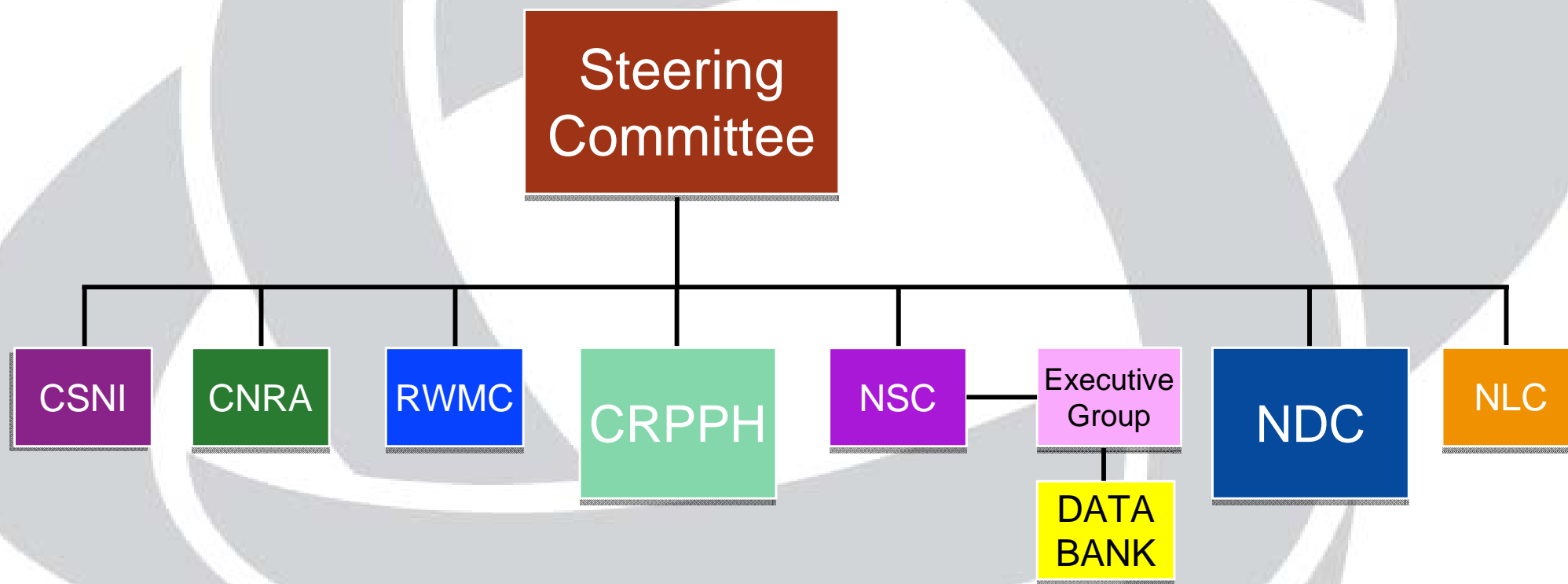
- ▶ NEA estimations of projected nuclear growth in its Nuclear Energy Outlook (NEO).
- ▶ A precise estimate of the requirements for skilled manpower in the nuclear field is difficult to determine.
- ▶ Governments and industry have to consider how to replace the current ageing workforce in order to continue to run and properly decommission existing facilities.

Global Nuclear Capacity in the NEA High and Low Scenarios



Source: Nuclear Energy Agency (2008), *Nuclear Energy Outlook*, OECD, Paris.

NEA Studies of Issues in and Approaches to Maintaining Qualified Human Resources



NDC Work

Nuclear Education and Training: Cause for Concern? (2000)

- ▶ The deterioration of nuclear education
- ▶ The important role of governments in nuclear education
- ▶ Challenges of revitalising nuclear education.
- ▶ High-quality training is needed for staff in industry and research institutes
- ▶ There are benefits of collaboration and sharing best practices

NDC Work

Nuclear Competence Building (2004)

- ▶ Nuclear education and training

There is a need to focus on these issues

- ▶ Human resources

It is necessary to conduct periodic need assessments

- ▶ Research and development

Government focus on R&D, including funding, is needed

- ▶ International collaboration

A functional, international framework to support education and training would be useful

NDC Work

Education, Training and Knowledge Management (2010)

address the recommendations of previous reports, the NDC has commissioned a new study aiming to:

Show the current situation of nuclear-related education and training, based on the analysis of quantitative and qualitative data.

Analyse the situation of educational programmes in the nuclear field in member countries as well as international initiatives.

Identify the issues and current and future needs of government and industry relative to nuclear related education and training and potential emerging gaps.

Draw conclusions and formulate recommendations.

The main output from the project will be an NEA monograph **available by the end of 2010.**

CRPPH Collective Opinions

Radiation Protection Today and Tomorrow (1994)

Because of the dynamic nature of the protection field, the prospect of new radiation practices, and changing public attitudes toward risk, it is important that the wealth of expertise and resources for protection and related fields which has been accumulated so far is preserved in order to guarantee adequate and cost-effective protection.

Radiation Protection in Today's World: Towards Sustainability (2007)

Knowledge management has recently been attracting much attention to secure reliable human resources and for the success of the technologies, especially for maintenances and repairs. In this context, knowledge management procedures should be developed as soon as possible

CRPPH 1996, 2001, 2005 University Survey

- ▶ How, in various countries, do radiation protection professionals receive their education, and how many trained personnel are produced?
- ▶ To address these questions, and to foster a broader exchange of ideas and research in radiation protection, the CRPPH performed a series of surveys of universities in its member countries that offer degrees in radiation protection.

Data from the 2005 University Survey

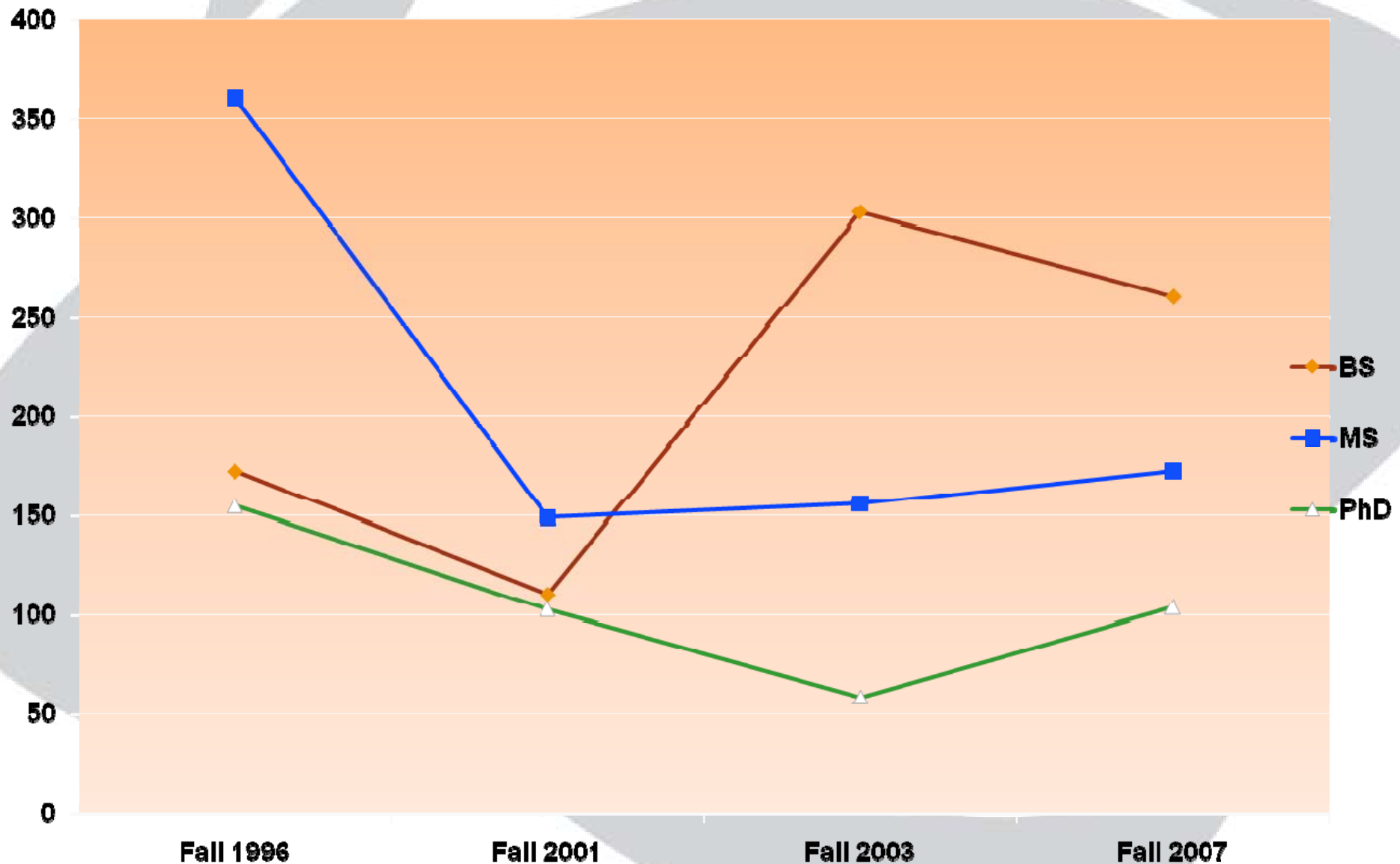
Country	Number of RP Degree-granting Universities
Australia	2
Canada	1
Czech Republic	1
Finland	3
France	2
Germany	1
Greece	3
Israel	1
Italy	4
Japan	7

Country	Number of RP Degree-granting Universities
Korea	6
Poland	2
Slovenia	2
Spain	2
Sweden	3
Switzerland	4
Turkey	4
United Kingdom	11
United States (2007)	31

Total number of RP Degree-granting Universities: 90

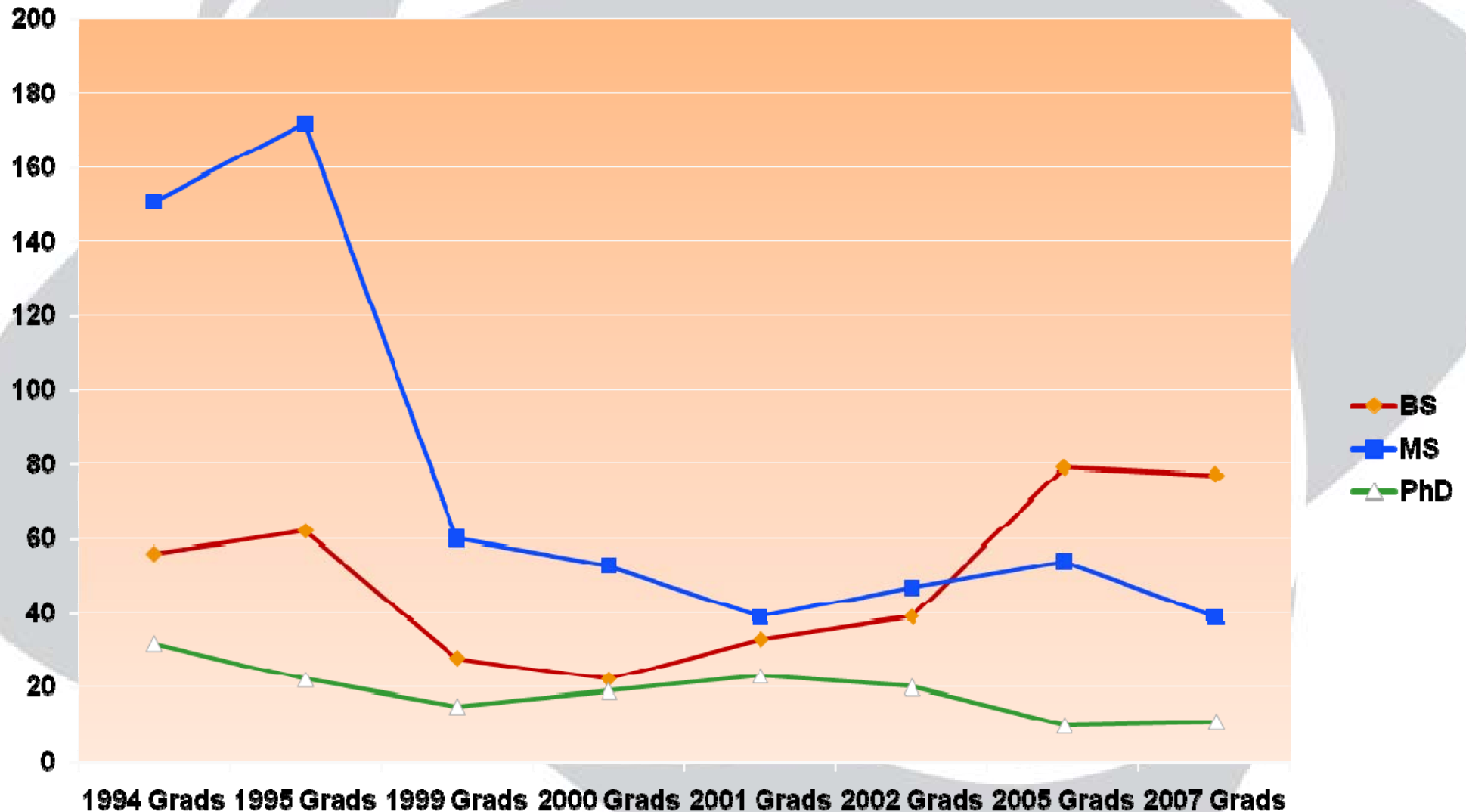
Source: 2005 CRPPH University Survey, NEA/CRPPH(2005)8.

Enrolment in RP Programmes at All US Universities Offering Degrees



Source: *Health Physics Education Reference Book 2007-2008*, Health Physics Society, Academic Education Committee, October 2007.

RP Diplomas Granted at all US Universities Offering Degrees



Source: *Health Physics Education Reference Book 2007-2008*, Health Physics Society, Academic Education Committee, October 2007.

2009 CRPPH Meeting Topical Session

- ▶ At its 67th meeting in May 2009, the CRPPH held a topical session to discuss the issue of qualified human resources
- ▶ The session was prepared by a questionnaire to CRPPH members
 - ↪ RP Challenges?
 - ↪ Responses to RP challenges?
 - ↪ Is RP response part of a broader framework?

CRPPH Topical Session

The invited presenters and a panel discussion were challenged to address:

- ▶ The extent and health of educational and training programmes in place.
- ▶ Any collaborative efforts in place or being planned to enhance educational opportunities, research and expertise in the nuclear field.
- ▶ Efforts to attract young professionals to radiation protection.
- ▶ What might be the role for CRPPH in addressing these needs.

Results of Discussion

- ▶ The current focus in the nuclear industry seems to be focused on technician training programmes, but there is recognition of the need also for degreed professionals.
- ▶ It was agreed that the career path in radiation protection needs to be made more visible and attractive, especially for professionals at the level of Bachelor of Science.
- ▶ Support from governments and industry appears to be improving.
- ☛ **The focus of national concerns seems to be on the nuclear industry, but the efforts are also needed for other sectors.**
- ☛ **Efforts should be increased to provide professionals at a high level of knowledge and skills, rather than simply satisfying minimal requirements.**

CRPPH Follow-up

CRPPH then discussed possible follow-up activities. These included:

- ▶ **Collect information on requirements...**
for education and experience, and the roles of the Radiation Protection Expert;
- ▶ **Exchange experience with the specification of expertise requirements...**
for a “passport” that would allow international acceptance of qualifications.
- ▶ **Exchange experience on approaches...**
for government support of education in radiation protection.
- ▶ **Exchange approaches to defining the responsibilities of...**
Radiation Protection Experts and Officers.
- ▶ **Partner with IRPA and its associate societies...**
to enhance the image and vision of the radiation protection profession, including its emphasis on both science and ethics; and to distribute material about the radiation protection profession in high schools, universities and medical schools.

The CRPPH will decide on
specific follow-up actions at its **May 2010 Annual Meeting.**

Conclusions

- ▶ The nuclear sector, and all other applications involving ionising radiation, face potentially significant difficulties in the future to capture the knowledge of today's experts and workers, and to educate and train sufficient workers to maintain safe operations and continue advancing research.
- ▶ Governments, industry, academia and research institutes must work together to address this important and complex issue.