

**Radiological data from German Nuclear Power Plants
During the Transition From
Operation to Decommissioning
– the Need for an Improved Data Acquisition Structure
for Utilities under Decommissioning**

ALARA Symposium

Cambridge, 17th to 19th November 2010

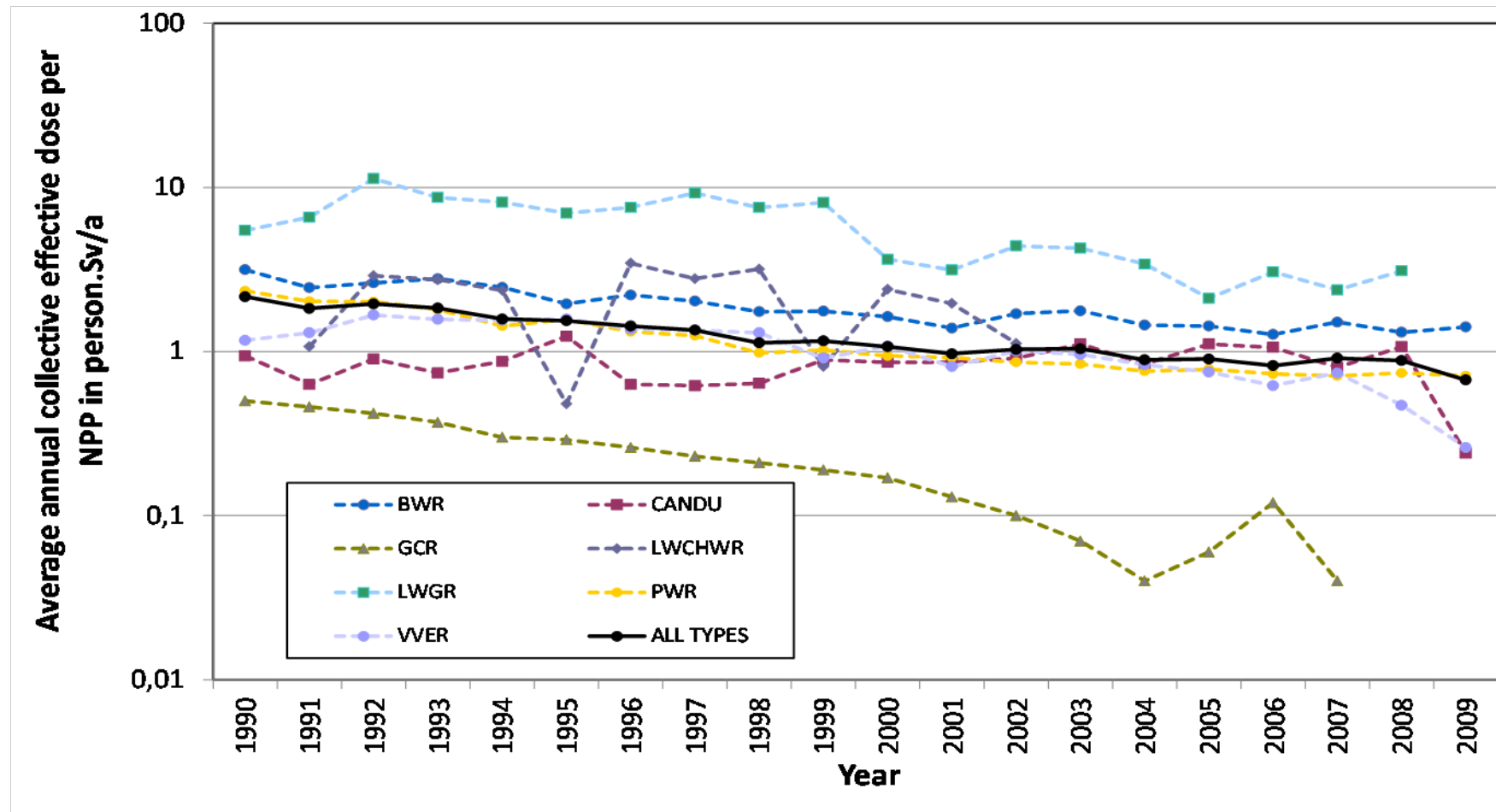
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Outline

- Introduction - Worldwide trends in occupational exposure
- Occupational Exposure in German Nuclear Power Plants under Decommissioning
- The Occupational Exposure of German NPPs during the Transition from Operation to Decommissioning
- A Closer Look on Job, Task and Sub-Task Doses – Understanding the Origins of the Occupational Exposure
- Conclusion and Outlook

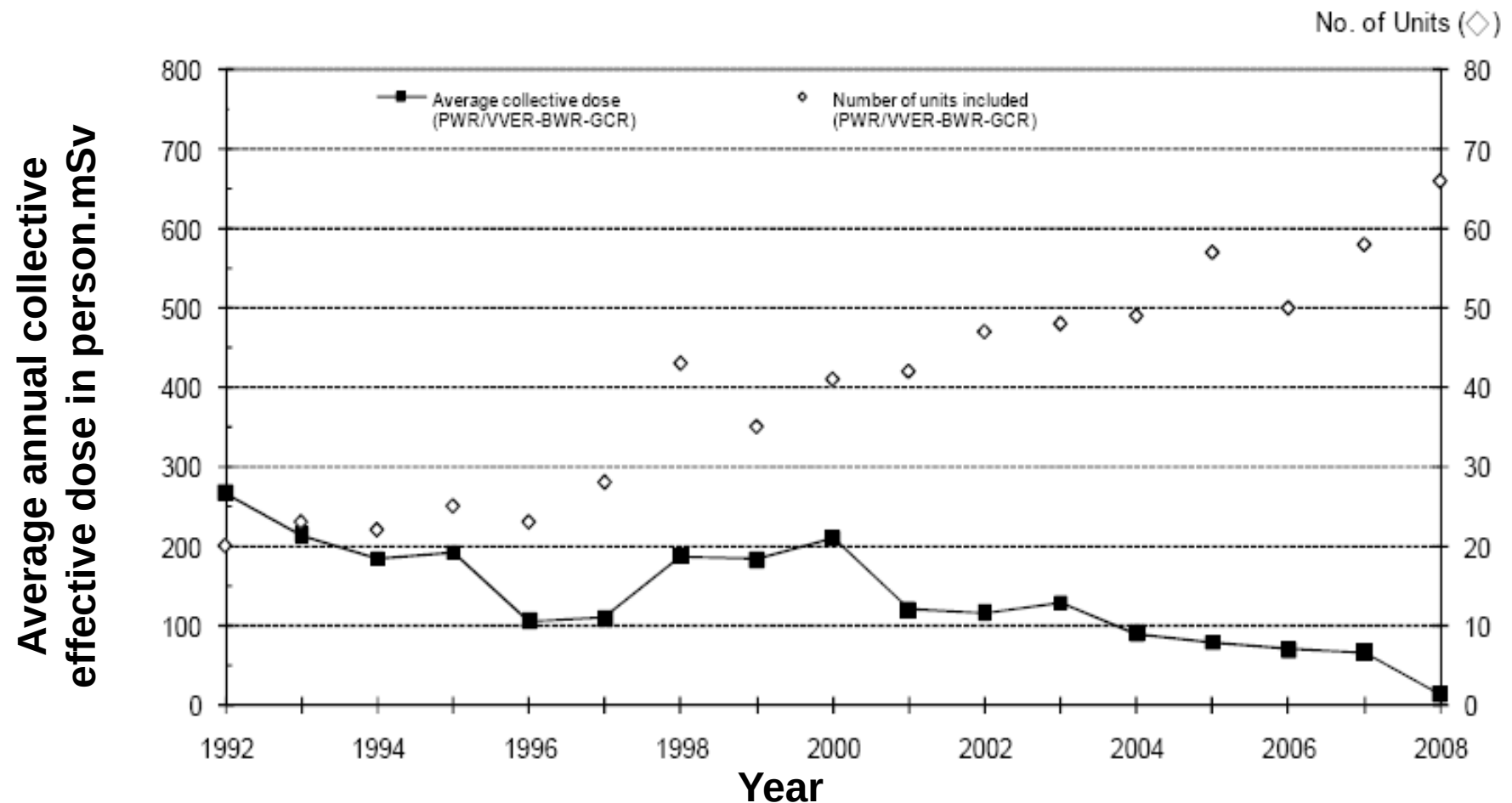
Introduction - Occupational Exposure in Nuclear Power Plants Worldwide

- NPPs in operation - Three years rolling average annual collective dose per NPP in person.Sv/a (from the ISOE data base – representing 401 NPPs)



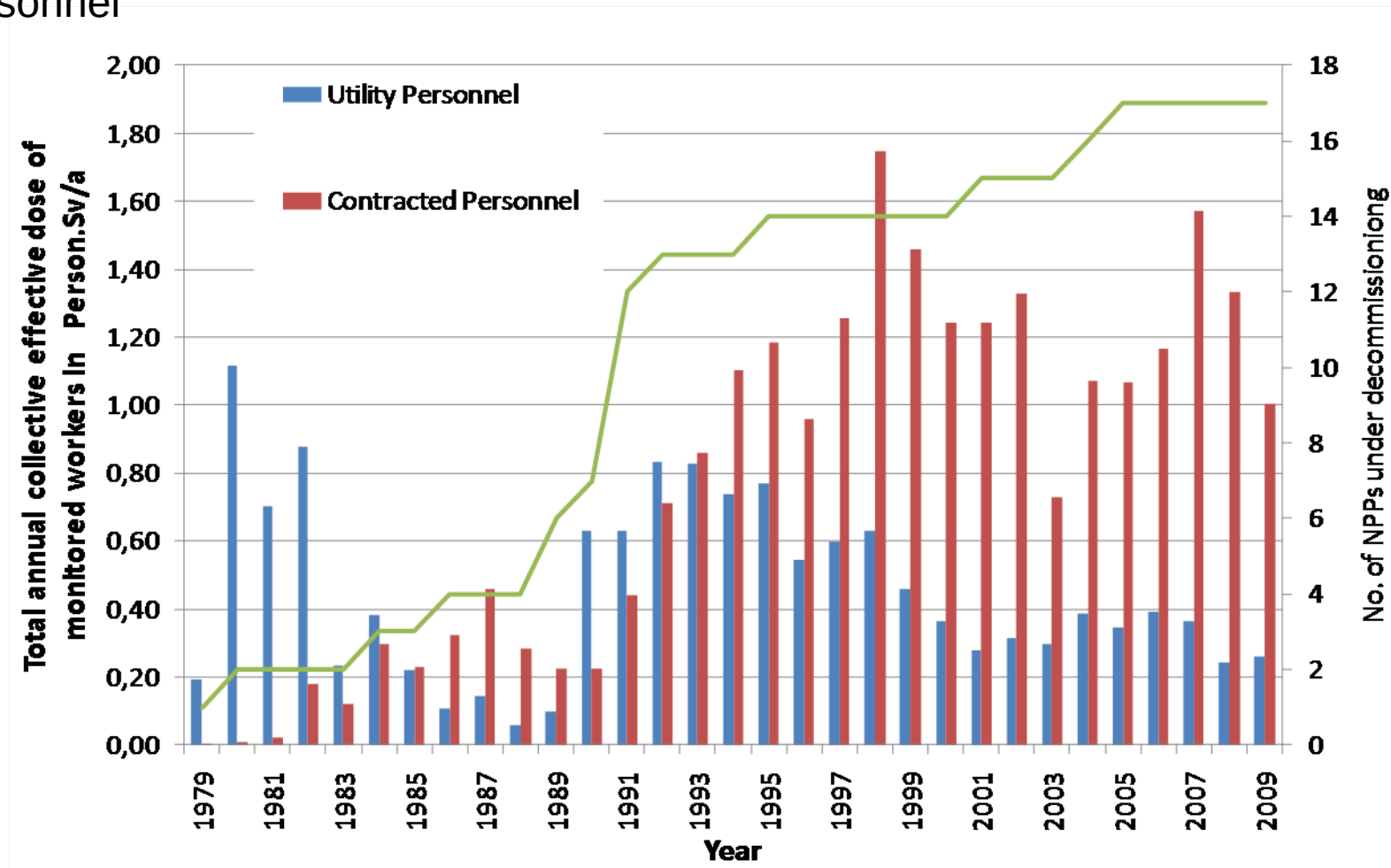
Introduction - Occupational Exposure in Nuclear Power Plants Worldwide

- NPPs under decommissioning (incl. shut down) - Average annual collective effective dose per NPP (from the ISOE data base – representing 70 NPPs)



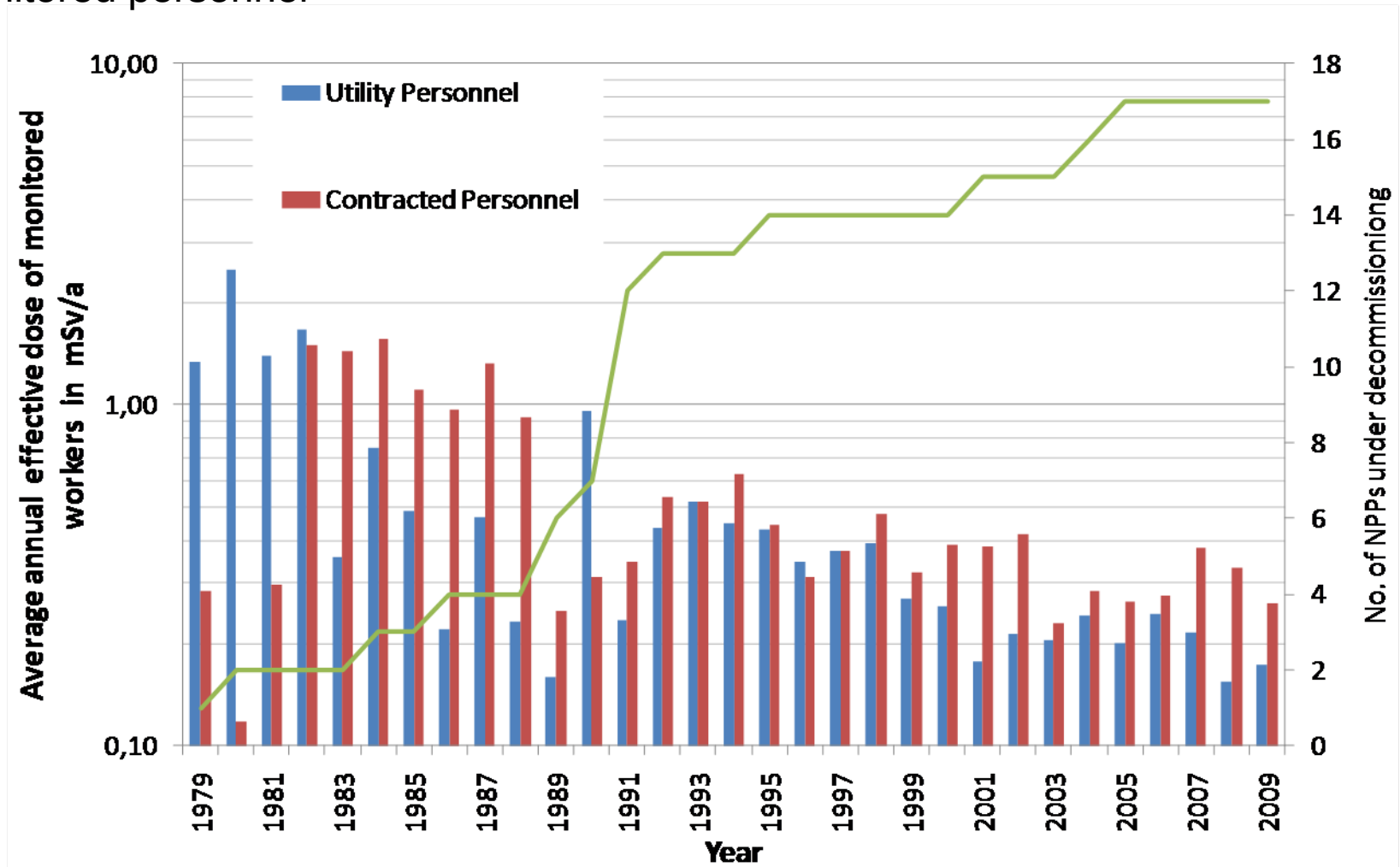
Occupational Exposure in German Nuclear Power Plants under Decommissioning (1/2)

- NPPs under decommissioning – Total annual collective effective dose of monitored personnel



Occupational Exposure in German Nuclear Power Plants under Decommissioning (2/2)

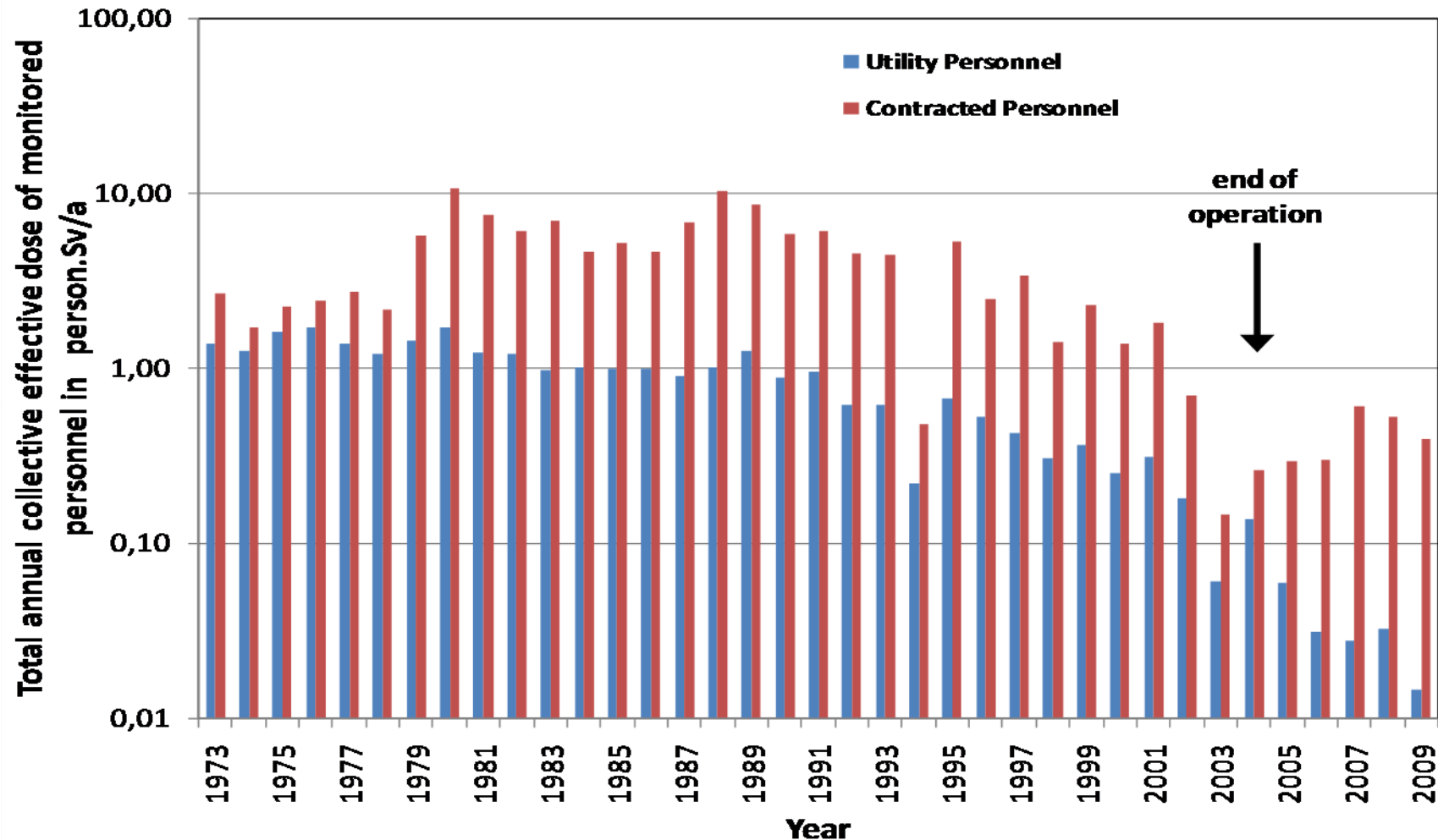
- NPPs under decommissioning – Average annual individual effective dose of monitored personnel



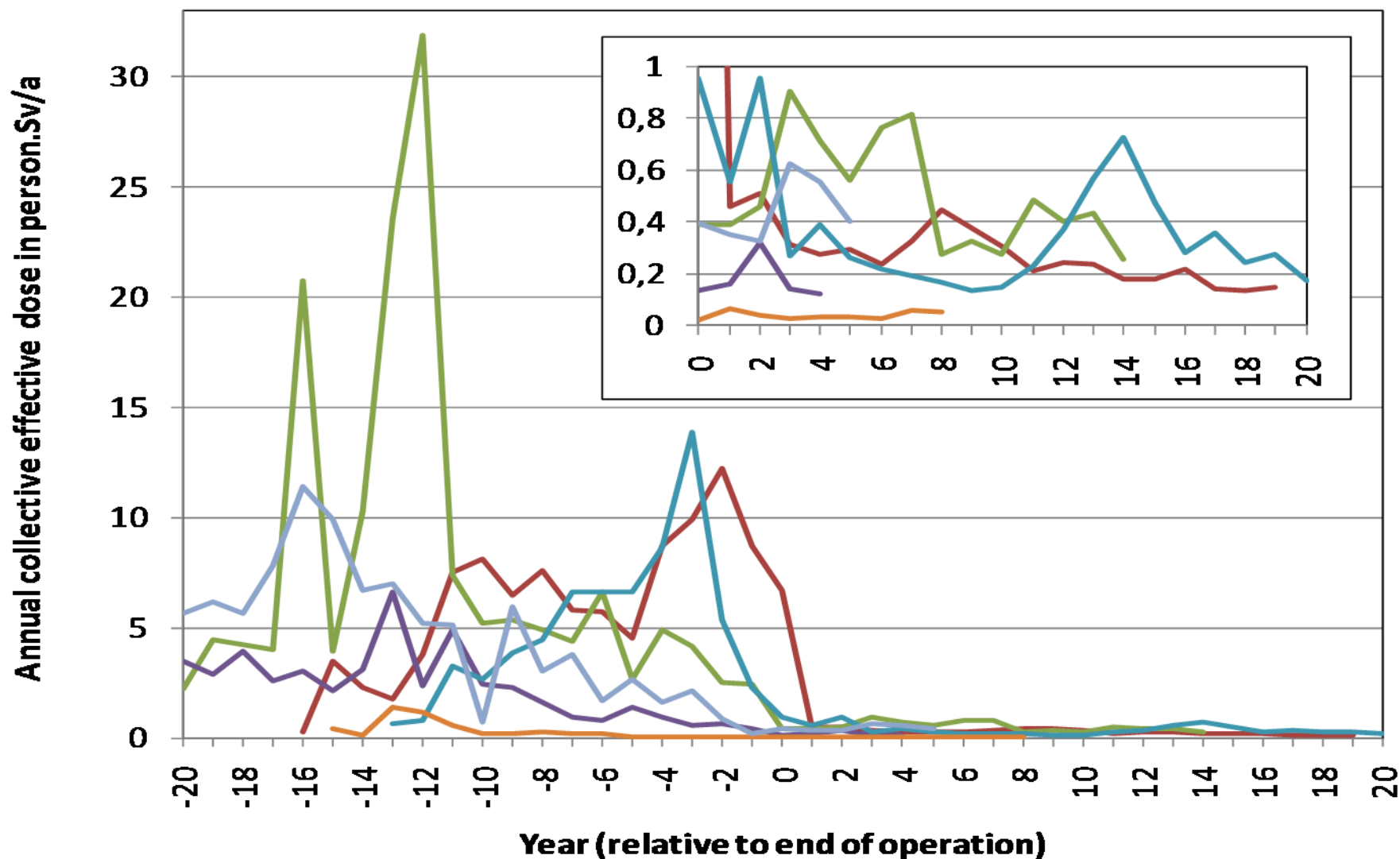
Occupational Exposure under Decommissioning

- average annual doses are much lower than in case of NPPs in operation
- But: no simple trends can be recognized
 - recorded doses strongly depend on the decommissioning work and the related radiological conditions
 - work activities change from year to year, following the overall work planning and decommissioning strategy for the NPP
 - the type, inventory and operational history of the NPP influence the radiological conditions
- improvements e.g. due to experience feedback take place, but they can only be identified on the level of an *individual NPP* and only if the radiological conditions and the performed works are *analysed in detail*

Transition from Operation to Decommissioning (an arbitrary German NPP)



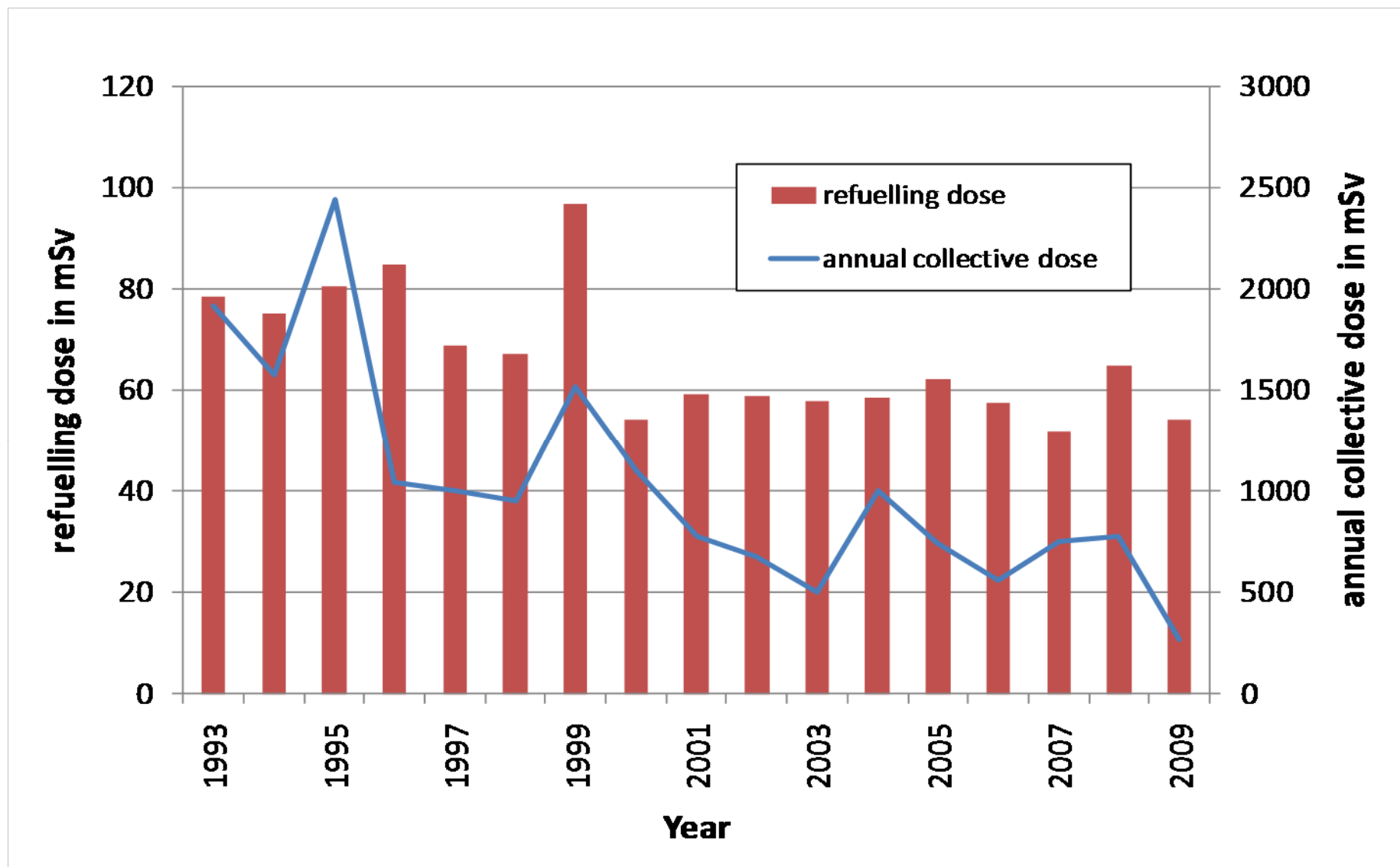
Transition from Operation to Decommissioning (several German decommissioning projects)



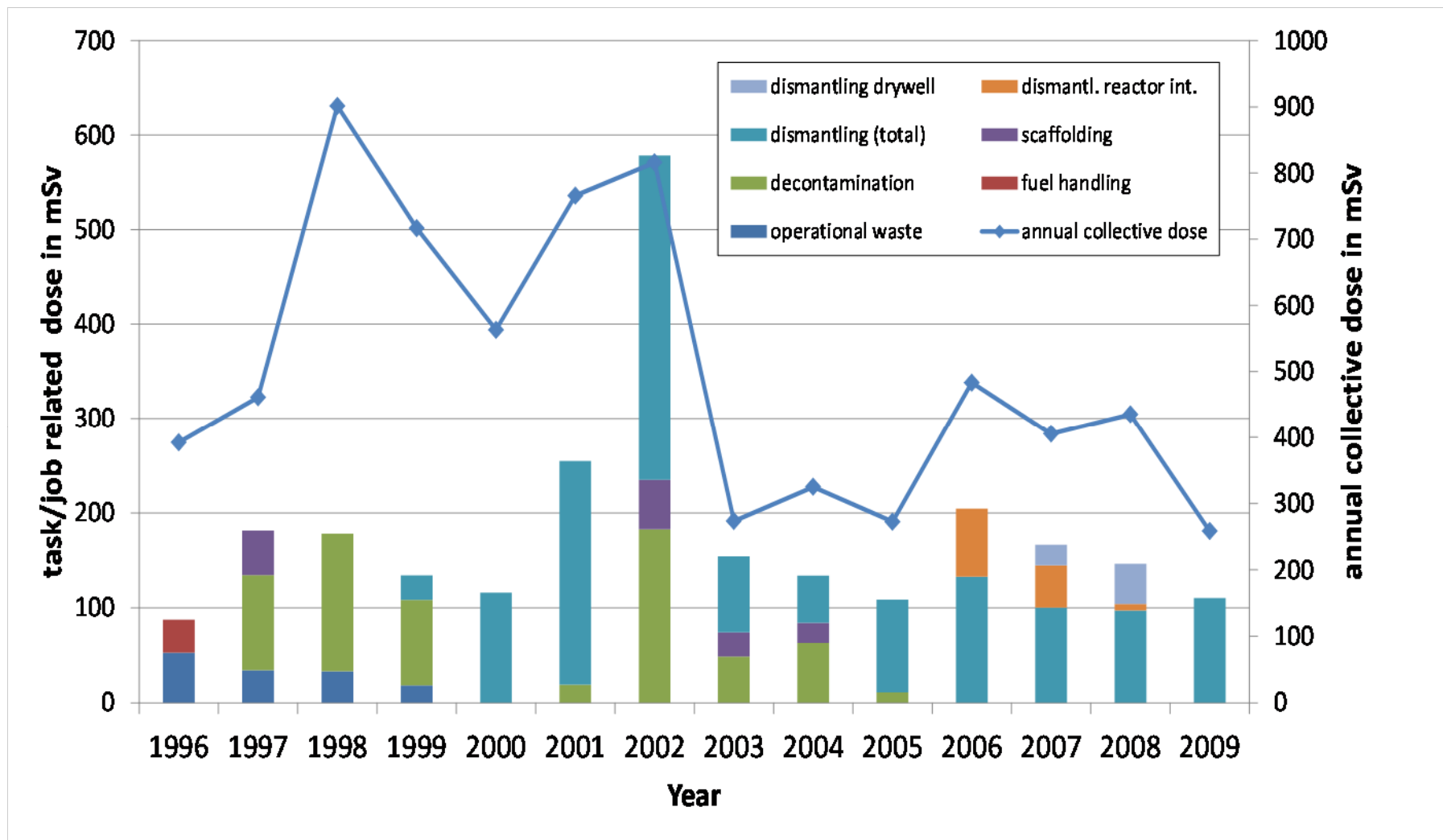
Transition from Operation to Decommissioning

- decommissioning related average annual individual effective dose is 10% to 20% with respect to operation (depending on NPP / performed works)
- dose reductions begin some years before the end of operation (if known before) due to e.g.
 - reduced workload during the last outages
 - less improvement activities will be performed
- during decommissioning, dose entities are changing from year to year
 - depending on the performed work – might “increase” years after beginning of decommissioning
 - variations can not be interpreted without detailed knowledge
- detailed analysis (job/task/subtask) is already implemented in ISOE, but...

A Closer Look on Job, Task and Sub-Task Doses (Operation)



A Closer Look on Job, Task and Sub-Task Doses (Decommissioning)



Conclusions

- dose under decommissioning may vary strongly from year to year
- in the ISOE, reported data on jobs and task do not necessarily sum up to the annual collective effective dose (difficult to retrieve, limited data structure, ...)
 - operational data can nevertheless be easier evaluated (*similar or often performed* works) than decommissioning data (*changing or once performed* works)
 - under decommissioning more specifications are needed than during operation (e.g. the job “decontamination” needs specification of decontaminated component, radiological surrounding, operational history, ...)

Outlook

- An improved ISOE data structure for decommissioning must
 - be detailed enough to reflect the complexity of decommissioning works
 - be easily structured enough to encourage the participants of ISOE to provide data as complete as possible
 - consider specific properties of decommissioning works
- ISOE goals:
 - hints on “best practice”
 - initiation of peer-by-peer discussion on radiation protection measures
- Challenge: balancing
 - the requirements on a data collection necessary to reach these goals
 - the practical limitations of data collection

- → ISOE WGDA task group

Thank you for your attention

