

To the Members of the Halden Programme Group

Invitation to Workshop Meeting on
“Advanced Control System Designs”
Genova, Italy, August 31st-September 1st, 2006

We have the pleasure of enclosing information on the topics to be discussed at the workshop on “*Advanced Control System Designs*” as well as on practical details of the arrangement.

The members of the Halden Programme Group are kindly asked to nominate participants to the workshop meeting, before 15th June 2006. The participants should be prepared, if time allows, to give short presentations on activities within their own organisation relevant for the topic of the meeting.

The workshop will be organised in Genova, Italy, on Thursday 31st August and Friday 1st September, 2006. The workshop is planned to start at 9.00 a.m. Thursday, and is expected to be adjourned in the early afternoon of Friday 1st September. This workshop is co-ordinated with the FLINS meeting, which will be held in Genova, Italy, on 29th- 31st August, 2006.

For further details on the scope of the meeting, please contact Mr. Paolo F. Fantoni. Participants registering for the workshop will receive additional background material on the workshop in due time before the meeting.

Halden, 1st February, 2006

Wolfgang Wiesenack
Project Manager

Workshop meeting on
“Advanced Control System Designs”

Genova, Italy, August 31st-September 1st, 2006

Introduction

Nuclear facilities rely on control systems to perform a variety of functions for successful operation. Many of these functions are critical for the safe operation of the facility. With high energy prices there is also increased interest for using more advanced control systems to maintain high availability and optimize power production.

Current plants use primarily single-input, single-output classical control schemes. Only in few cases multivariate control was employed in the 80s and 90s, like the three-element controllers for steam generators. However, modern control systems provide the capability to implement much more advanced control algorithms including multi-variable control, adaptive control, predictive control, fuzzy control and other AI methods. An issue is to evaluate the robustness of advanced control systems, and provide tools to assist plant personnel to distinguish between and react appropriately to different types of failures (e.g. sensors, equipment, control algorithms) in an integrated environment.

An expected change in control system development for nuclear power plants is the transfer of more of the decision-making responsibility to the I&C systems. Given the staffing and operational cycle goals of long-term deployment reactor concepts and the prospect of multi-modular plants with integrated process systems and/or control rooms, the move to highly automated control and information systems seems inevitable.

In this scenario, special consideration should be given to the design of adaptive control systems, in which the control system adjusts to changing characteristics of the controlled plant to maintain satisfactory stability and performance. In the adaptive control domain, the “intelligent agent-based control” design is a growing area of research. There are several advantages in the intelligent agent concept, e.g. they are interactive, adaptive, and can learn so their action may change with time and the process state, providing flexibility. The design and use of such systems require addressing several questions and the potential challenges like usability aspects, display design, licensability and system reliability.

To address the technical issues related to advanced control systems, the Halden Reactor Project is organising this workshop. The main objective will be the evaluation of the current status of research in this area, identifying technical issues that remain unresolved and warrant additional research, and recommend research programs to address the remaining issues.

Objective and scope

The main objectives of the workshop will be:

- Review the status of control systems for nuclear power plants and identify needs for current operating power plants, especially for plant upgrades. Future needs of next generation advanced reactors will also be discussed.
- Review the development trends of advanced control systems in other related industries of potential use/benefits for nuclear power plants
- Identify needs for analysis and assessment of advanced control concepts with focus on robustness, transparency, usability aspects, and needs for integration of operator support in such advanced systems.
- Implementation and licensing issues of advanced control systems.

Organisational Information

The workshop will take place at the Starhotel President in Genova, Italy on Thursday August 31st and Friday September 1st, 2006 (Starhotel President, Corte Lambruschini, 4, Genova, Italy (www.starhotels.com/marketing/italia/starhotel_president.htm) and will follow the FLINS 2006 Conference on Applied Artificial Intelligence (29-31 August 2006, www.fuzzy.ugent.be/flins2006) in the same hotel. It is anticipated that participants arrive in Genova in the evening of August 30th, as the workshop will open at 9.00 a.m. on Thursday August 31st. The workshop will be adjourned in the early afternoon of Friday September 1st. No charge will be made for the workshop and free lunch will be provided. The Project also have the pleasure of inviting all participants for dinner in the evening of Thursday August 31st.

Participants are kindly asked to register before 15th June, 2006 preferably by making use of the enclosed Registration Form.

For any further information on the scope of the workshop, please contact Mr. Paolo Fantoni, phone: +47 69 21 22 00, telefax: +47 69 21 24 60, Email: Paolo.Fantoni@hrp.no. For further information on practical arrangements, please contact Mrs. Grete Bjerkely, telephone: +47 69 21 22 53, telefax: +47 69 21 24 60, E-mail: Grete.Bjerkely@hrp.no.

The participants will receive a detailed programme and additional information in due time before the meeting.



Institutt for energiteknikk
OECD HALDEN REACTOR PROJECT

Please return to:
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before 15th June, 2006

REGISTRATION FORM

Workshop Meeting on "Advanced Control System Designs"

Genova, August 31st – September 1st, 2006

Name: -----

E-mail: -----

Company: -----

Company mailing address: -----

Company telephone No.: ----- Company telefax No.: -----

Date arriving - Genova----- Arrival time----- Flight No.-----

Date leaving - Genova----- Depart.time----- Flight No.-----

Will make use of the hotel reserved by the Project

☐☐☐

Yes

No

Smoker's Room

From----- to -----

Title of Presentation (if any):

Remarks: