Faculty Engineering Technology
Program Mechanical Engineering

University of Twente.

COLLOQUIUM

In accordance with article 4.6.8 of the SSNS-wb.

Group: **Engineering Fluid Dynamics**

As part of his MSc thesis assignment

G. B. Loohuis

will give a presentation, entitled:

CFD based Bowl Design of a Mixed-Flow Impeller-Bowl Pump

Date: Friday, December 17, 2010

Time: 09:00

Room: ZH 286

Summary:
The pressure build (head) of a pump normally decreases continuously with increasing flow rate. For mixed-flow and axial pumps, however, the flow rate vs. head characteristic curve may show a saddle-type instability for flow rates below the best-efficiency duty.
In the present study, a mixed-flow impeller-bowl pump is considered. The investigation has shown that the instability is connected to the part-load recirculation phenomenon, located at the inlet of the impeller and at the inlet of the diffuser (bowl).
Focusing on the recirculation at the inlet of the bowl, the bowl geometry is parameterized. The influence of the geometrical parameters on the performance instability is systematically investigated with the aid of computational fluid dynamics (CFD) simulations. The results of this parameter study have been used to design a bowl for which the pump performance curve is stable.

Assessment committee: **Chairman:**

Prof.dr.ir. H.W.M. Hoeijmakers	(chairman)
Dr.ir. N.P. Kruyt	(mentor)
Ir. R.J.H. Dijkers	(mentor Flowserve)
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d.d. November 17, 2010

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