

Warsaw, Sep. 24, 1992

REPORT ON EUROMECH COLLOQUIUM 298
"INELASTIC BEHAVIOUR OF STRUCTURES UNDER VARIABLE LOADS".

Warsaw, September 14-18, 1992

Conference Chairmen: Prof. Zenon Mróz, Inst.Fund.Tech.Research,Warsaw,
Prof. Dieter Weichert, University Lille,
Conference Secretary: Dr. Stanislaw Dorosz, Inst.Fund.Tech.Research,
Warsaw,

1. GENERAL INFORMATION

The Euromech Colloquium was devoted to the analysis of structures in the inelastic range of deformation under variable loading including the effects of elastic and plastic shake - down, alternating plasticity, ratchetting, transient and asymptotic cyclic states, material hardening, softening, damage effects and also accounting for non-linear geometric effects.

There were 55 participants at the Colloquium, presenting 52 lectures, with 11 general lectures (45 min.) and 41 presentations of original contributions (25 min.). Among 30 foreign participants there is the following country participation:

Italy - 2	Algeria - 2
France - 3	U.S.A - 1
Russia - 4	Japan - 1
Germany - 3	Australia - 1
Belgium - 2	Hungary - 1
Austria - 2	Canada - 1
Egypt - 2	Poland - 25

Polish participants (25) were mostly researchers of technical universities and the institutes of the Polish Academy of Science (Inst.

of Fundamental Technological Research, Inst. of Fluid Machines, etc.).

Euromech Colloquium was devoted to the memory of Prof. Jan Andrzej Konig, prominent Polish researcher in the area of inelastic analysis of structures, author of fundamental contributions to the theory of elasto-plastic shake-down. He passed away on Dec. 11, 1990.

Partial financial support was provided by CISM(Udine) and Tempus Project No.43890. Total cost including preprints, accommodation, cocktail banquet was \$ 370 if in single room or \$ 340 in duble room.

2. MAJOR CONFERENCE TOPICS

The topics discussed during the colloquium can be classified into the following groups

1. Elasto-plastic structure response under varying mechanical and thermal loads.
2. Non-linear geometric and physical effects in shake-down problems.
3. Mathematical aspects of elastic and plastic shake down problems.
4. Engineering applications of shake-down problems (pressure bellows, compensators, rail and pavement problems).
5. Problems with unilateral constraints, contact problems.
6. Inelastic material response under variable loads.

The scope of the conference was thus much wider than that of the previous Euromech on this topic organized by Prof. C.Polizzotto in 1983 in Palermo, Italy. Here, the unified view was aimed to understand both inelastic material and structure response under variable loading and to provide treatment of problems with account for geometric or physical non-linearity. The attempt to extend classical shake-down theory of Melan and Koiter to geometrically non-linear problems was discussed at length during one session. The industrial application to analysis and design of pressure bellows and compensators under thermal and pressure cycles was very important as well as treatment of railway and pavement problems for which rational design rules can be developed by using the shakedown and cyclic plasticity approaches. Cyclic response and damage of materials were treated during one session.

3. PERSPECTIVES OF FUTURE RESEARCH

The topic treated within the Colloquium are fundamental for both structures and materials. They are also essential for technological process such as metal working, surface treatment, etc. The identification of failure modes, especially coupled modes and their interaction, such as low-cycle fatigue, progressive rupture, contact surface wear and corrugation, buckling-cyclic-plasticity, etc. constitutes the important contribution of research into engineering methods of safety assessment and rational design. It is therefore useful to have similar conferences every 3-4 years and to advance education of a wider engineering community about recent developments.

Conference Chairmen:


Prof. Zenon Mróz