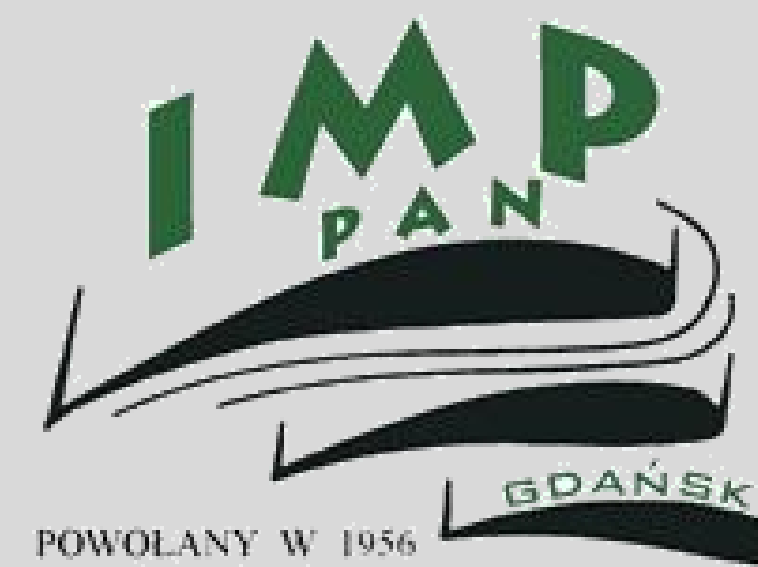


THE SZEWALSKI INSTITUTE OF FLUID-FLOW MACHINERY, PAS (IMP PAN)

CENTRE FOR MECHANICS OF LIQUIDS

DEPARTMENT OF HYDRAULIC MACHINERY



EXPERTISE AND TECHNICAL CONDITION ASSESSMENT OF HYDROUNITS

The Szeowski IFFM offers a specialized technical expertise aimed:

- to identify the causes of any kind of failure and destruction of hydraulic machinery
- to assess the technical condition of hydraulic equipment (nondestructive testing of hydrounit structural components, testing of hydrounit dynamic state, etc.)
- to assess the indication accuracy of some of the measuring systems of power plants (eg ultrasonic flowmeters, vibration diagnostic systems)

Technical expertise include explaining issues such as the destruction caused by water hammer (see figures) and resonance phenomena, excessive vibration in the bearing nodes of hydrounit and others. Tests performed in the framework of the expertise are conducted in accordance with current standards and norms.

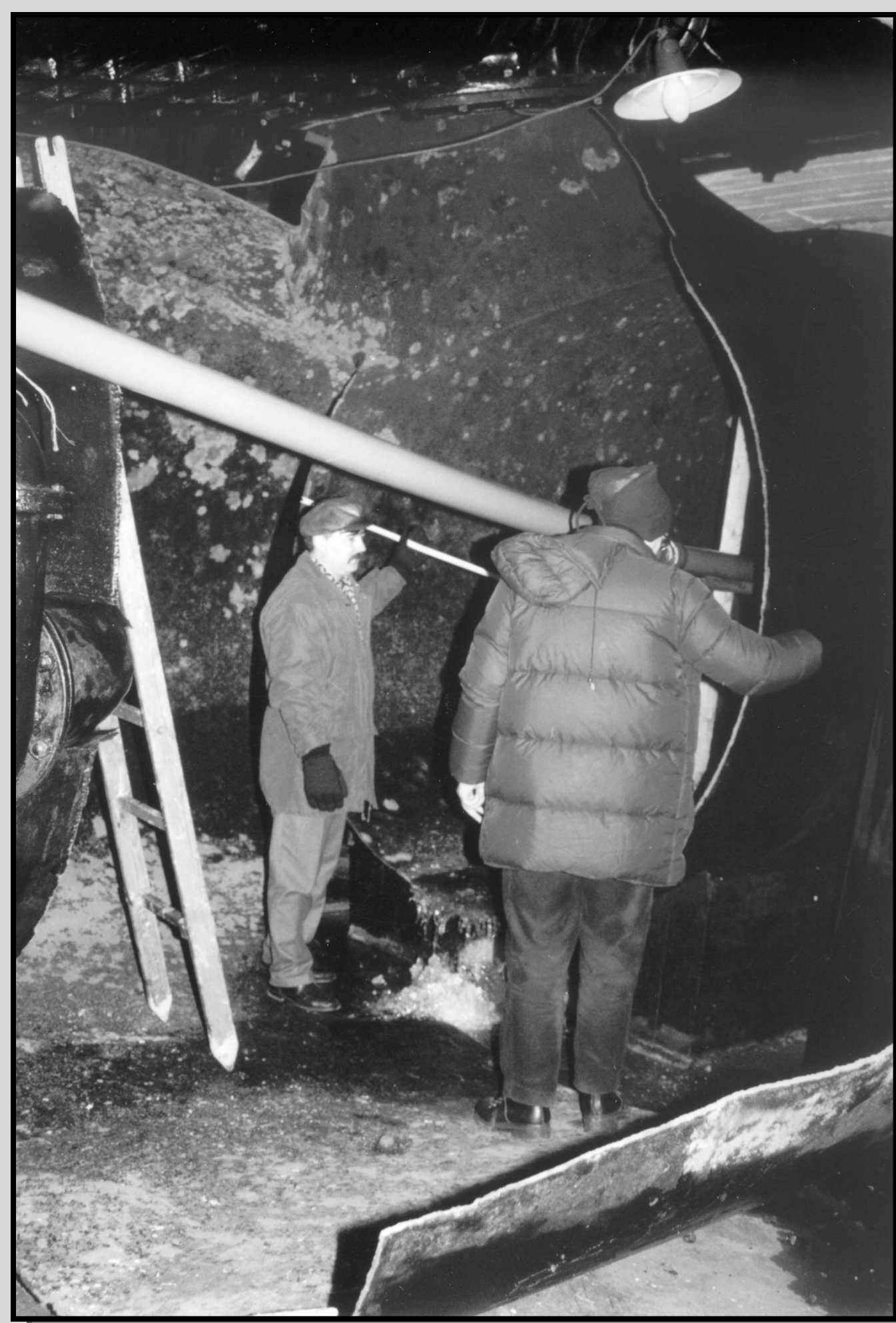


Fig. 1. Broken segment of penstock left branch.

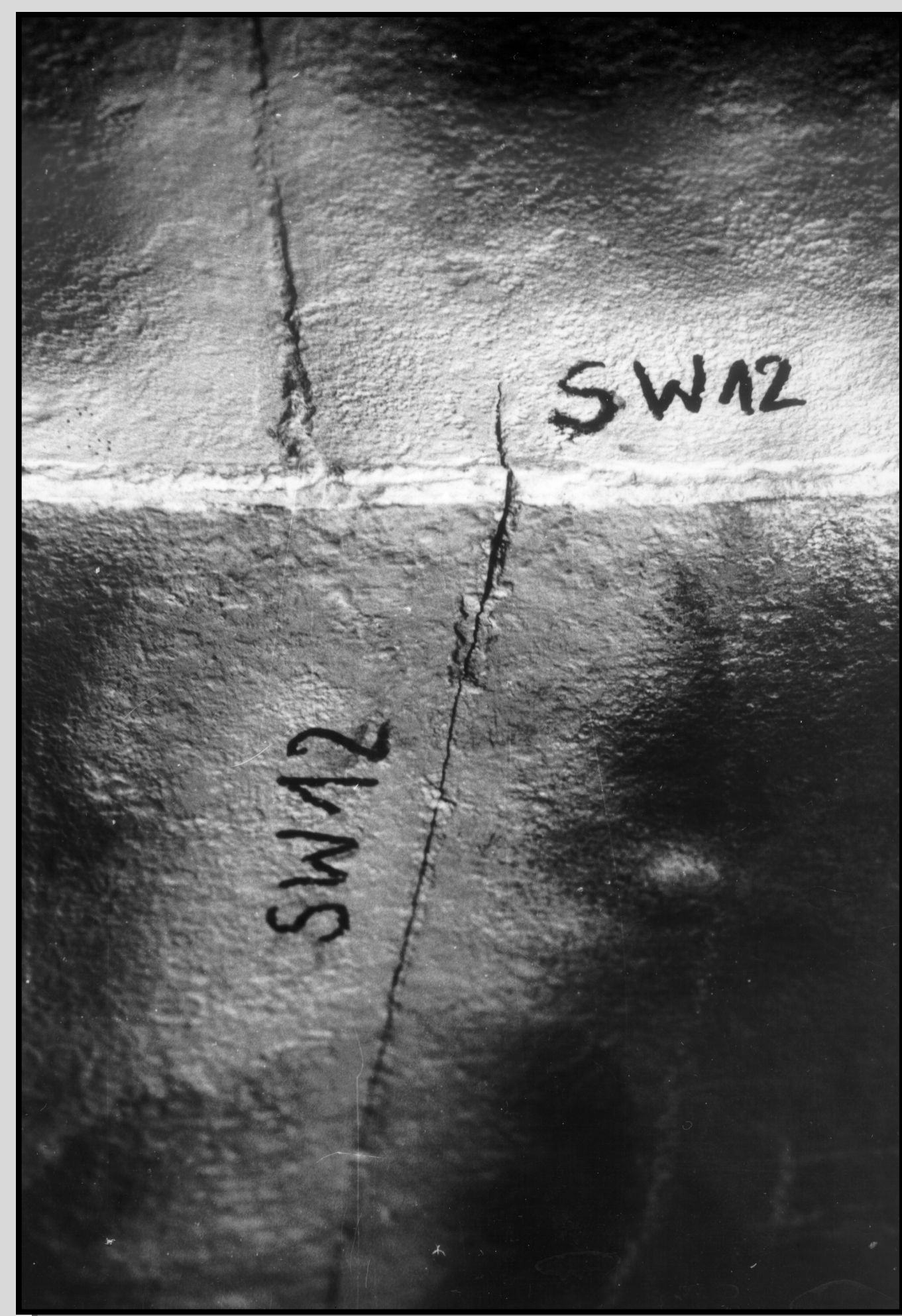


Fig. 2. Cracking of penstock right branch in region of connection of conical part of penstock shell with inlet pipe to genset No. 1 – inside view.

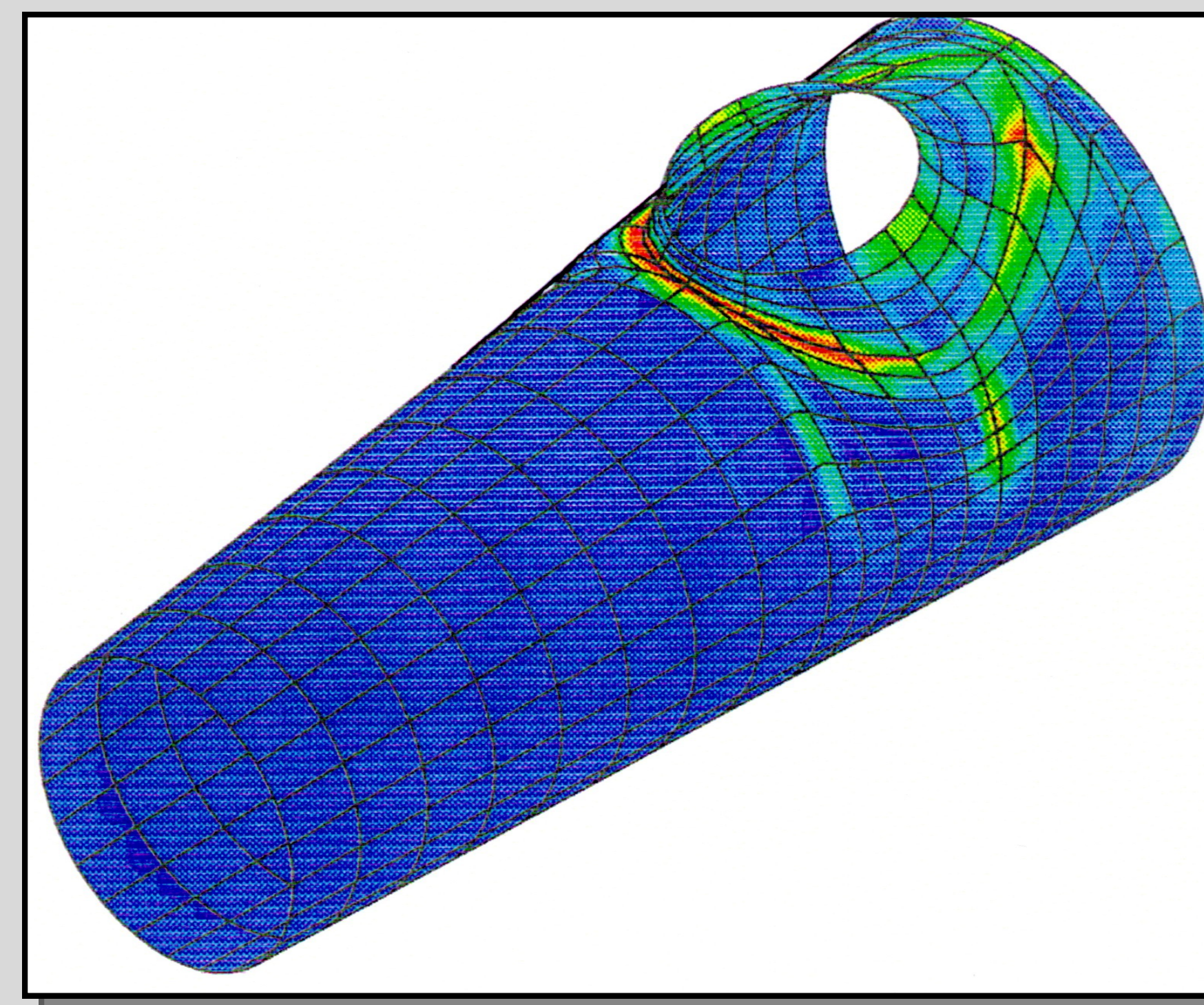


Fig. 3. Distribution of equivalent stresses in broken segment of penstock.

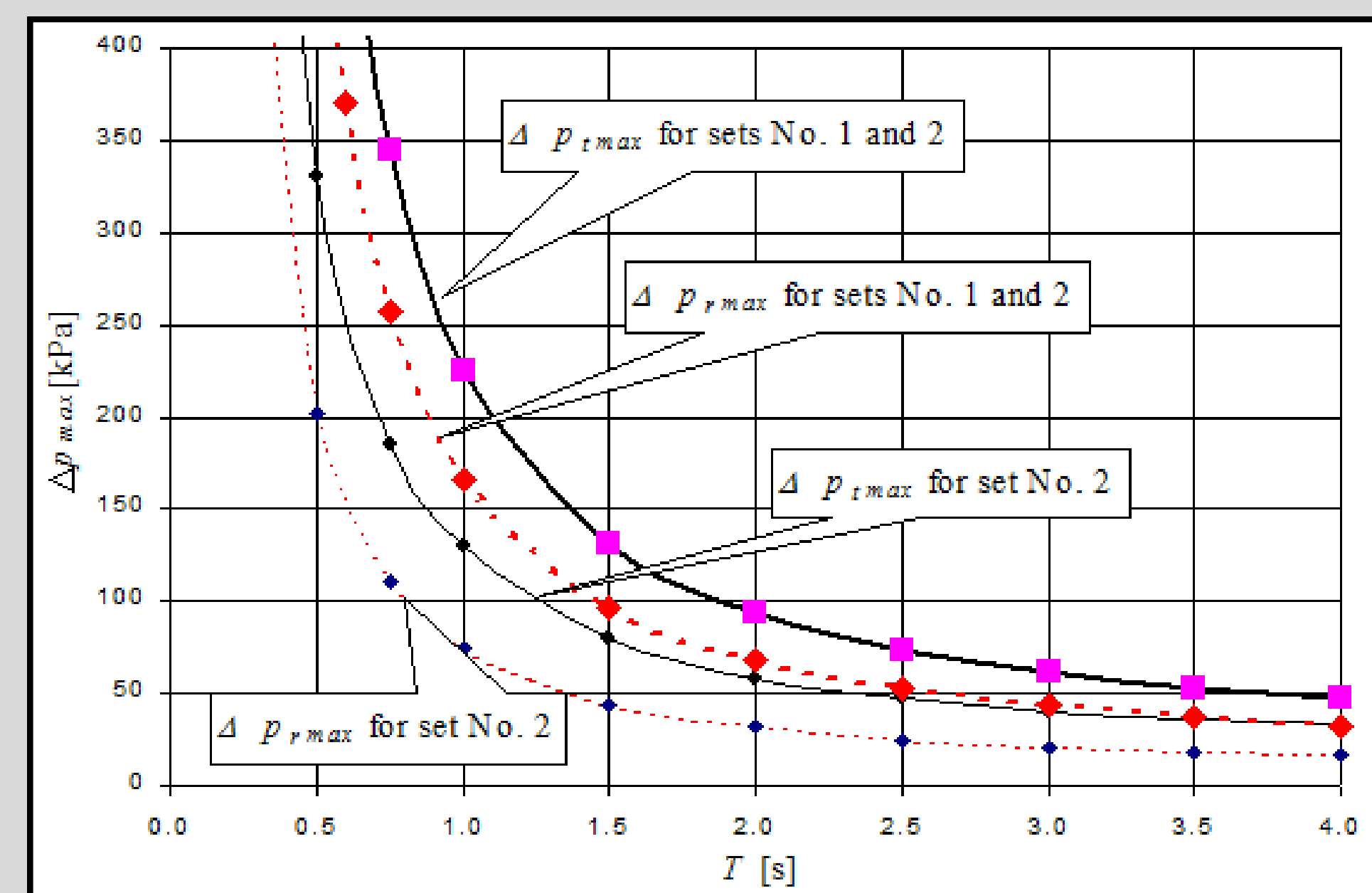


Fig. 4. Maximum Rise of Pressure in the Penstock As a Function of Time of Linear Wicket Gate Closure Calculated For Full Load Rejection From Genset 1 and 2 and Simultaneous Full Load Rejection From Both Gensets.

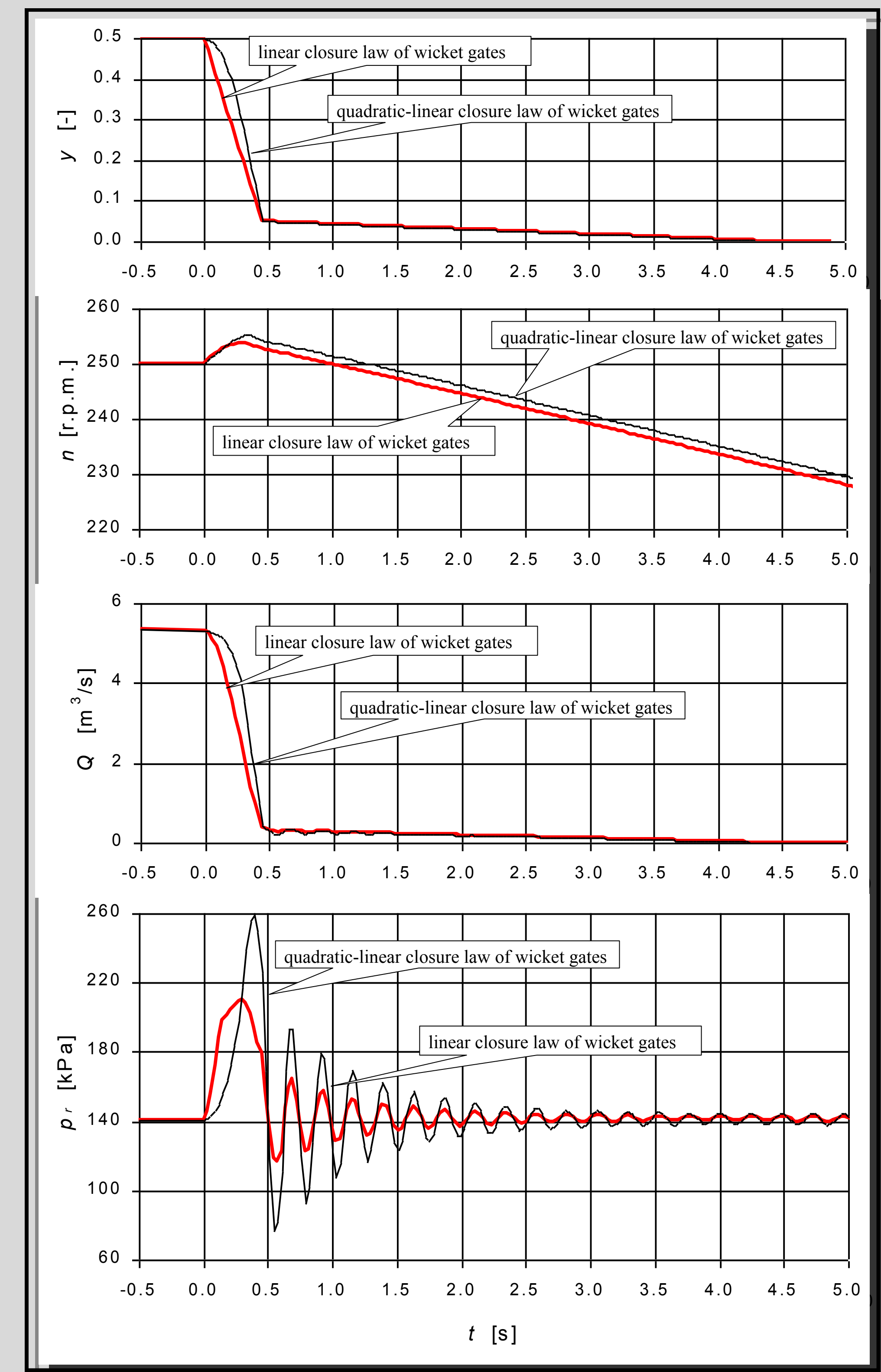


Fig. 5. An exemplary transients calculated for failure conditions.

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