2.4 Basic engineering geology
2.5 Climatic conditions of building in concrete regions
3. Processes in the nature
3.1 Processes in the atmosphere
3.2 Processes in the hydrosphere
3.3 Processes in the biosphere
3.4 Processes in the lythosphere
3.5 Complex protection of the territory from dangerous geological and hydrometeorological processes
4. Engineering requirements for industrial and civil construction

SAMPLE CURRICULUM FOR LABORATORY SEMINARS

1. Physical properties of minerals
2. Basic minerals in rocks
3. Major magmatical rocks
4. Sea sediment rocks
5. Crumbly continental sediments
6. Principle metamorphic rocks
7. Classification or rocks
8. Geologic map and geologic section (with home assignment)

SAMPLE CURRICULUM FOR PRACTICAL EXPERIENCE (FIELD WORK)

1. The study of the hydrometeorological conditions of construction
2. Solving hydrochloric assignment (home assignments)
3. Making hydrologic maps and analyzing various areas in terms of hydrologic conditions (home assignment)
4. Making geological map and analyzing different areas with different hydrological conditions
5. Seismic division into micro-regions of the territory on geological maps and geologic sections
6. Solving problems concerning geologic processes
7. Divising technical projects meeting the engineering requirements and basic criteria of the programme guided by a geologic map
8. Solving complicated assignments concerning the protection of the environment and its rational use

SYMPOSIUM

TRANSFER OF TECHNOLOGIES 2000

THE EUROPEAN STEEL DESIGN EDUCATIONAL PROGRAMME FOR THE CZECHOSLOVAK PRAXIS

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Abstract

ESDEP - European Steel Design Education Programme is a initiative to encourage the common market of structural steel in Europe. The paper is aimed at showing Czech Technical University participation in the project and the experiences from the participation in the Computer Aided Learning Committee. The activities under TEMPUS Joint European Project are included to describe the way of help of West European Universities for Czechoslovakian praxis due to introduction of structural Eurocodes into CTU education programs.

1. THE EUROPEAN STEEL DESIGN EDUCATIONAL PROGRAMME

ESDEP aims to educate our steel designers for the 90's and beyond with courses for undergraduates, postgraduates and practicing engineers. The project has the financial backing of COMETT, the European Community Action Programme for Education and Training for Technology and is supported by universities, polytechnics and the European steel industry. The Czechoslovakian part of the project will be supported by the Czechoslovakian Steel Fabricators Association. The key to increasing the European market in steel is to encourage designers to specify in steel by providing expertise and familiarity with the material. This can be achieved by improving the teaching of design of steel structures throughout Europe. In particular, by producing detailed background and educational material on the new Eurocodes (EC) with a comprehensive range of design examples, ESDEP will help

Europe's steel industry to meet the challenges of 1993.

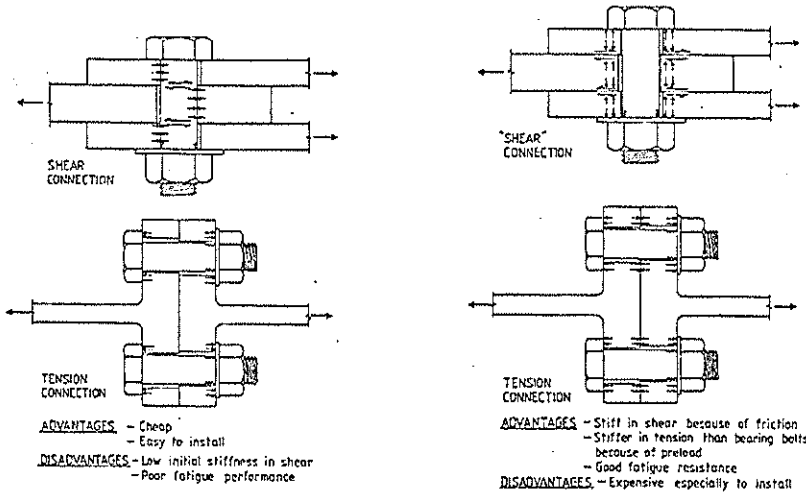
The adoption of common standards in 1993 will have major implications for the steel industry with more significance to small countries. Work is well-advanced on Eurocode 3 for steel structures, Eurocode 4 for composite steel and concrete structures, and their supporting reference standards, the drawn on the best expertise available in the European Community. Now the international collaboration is maintained in the preparation of the supporting teaching material for both students and practicing engineers so the all European countries may benefit from unique common standards. In the EC counties all standardization activity has to follow the Eurocodes, but the previous national standards will be still used parallel.

Many of the members of international drafting committees for Eurocodes 3 and 4 assist to ESDEP. A comprehensive set of ESDEP teaching aids is produced to cover all aspects of structural steel design and construction. This material will be used for undergraduate and postgraduate degree courses and for continuing professional development. Drafting is carried out by seventeen Working Groups based at many centers thought Europe. All groups are including representatives from industry and educational establishments. The Working groups from several countries are preparing 212 lectures. The lectures could be divided into major parts:

Economics of steel construction
Design concepts for steel structures
Applied metallurgy
Fabrication and Construction
Protection
CAD/CAM/CIM
Stability
Element design
Plated elements
Thin walled elements
Composite construction
Connection design
Fatigue design
Structural systems

Most of the lectures have now reached the stage of being at the second final draft and under linguistic review. The overview will be organize on the national bases. From CTU Prof. Studnicka will take part in the final revision in overview committee. To support the lectures is leading on to the production of computer software, slides to go with lectures, videos, case studies of actual designs and, most important of all, the translations of all materials in to all the relevant languages.

The lecture translations deadline is end of the year 1992. The end of the software development is in 1993. The initial University and Industry Seminars, ESDEP Promotion, Laughing Meetings in each Country, the Monitor Initial ESDEP use and software updating is scheduled on years 1993 - 1994.



Bearing type bolts High strength friction grip bolts

Fig. 1 Example from Lecture: Introduction to connection design, WG No.11: Static Connection Design, first draft, A.M. Gresnight.

2. THE INTRODUCTION OF THE STRUCTURAL EUROCODES

The Czech Technical University in Prague, the University of Wales in Cardiff, Universita Degli Studi di Trento and Universite de Liege obtained the grant Trans-European Mobility Scheme for University Studies (TEMPUS, J-0212-90) of Commission of the European Community. One part of the project is streamed to the Introduction of the Structural Eurocodes into the Czechoslovakian practice. The grant enable the CTU to participate in work of main ESDEP committee as a observer. At the Department of Steel Structures we are working under TEMPUS project on :

(i) Introduction of structural Eurocodes (EC3- Design of Steel Structures, 4- Design of Composite Steel Concrete Structures and 5- Design of Timber Structures) into praxis due to preparing worked examples for practical design. On this worked examples, calculation models, are based the lectures for practical engineers, which are prepared for each year till 1993. In September the workshop took place at CTU with 150 participants.

(ii) The Eurocodes are based on common principles for safety modeling of structures and for material and production requirements. On the other hand there is a great possibility to introduce a national application principles as well as identify some values, mostly partial safety and material factors, and

specify it by member states. At CTU we are working on the calibration of this 'box' values according our standards, loading, and industrial regulation. The Eurocodes depends on the same principles, ultimate states and inelastic design, as Czechoslovakian standard.

(iii) The CTU will participate on national requirements with our standard organization. The University has the possibility to coordinate Czechoslovakian cooperation with CEN, European Standard Organization.

(iv) For the CTU lectures, 1992, are under preparation the flow charts of major elements design procedures according the EC 3, 4, 5.

(v) We are working on the special CAL program streamed only on application of worked examples according the EC 3, 4, 5 into praxis and education.

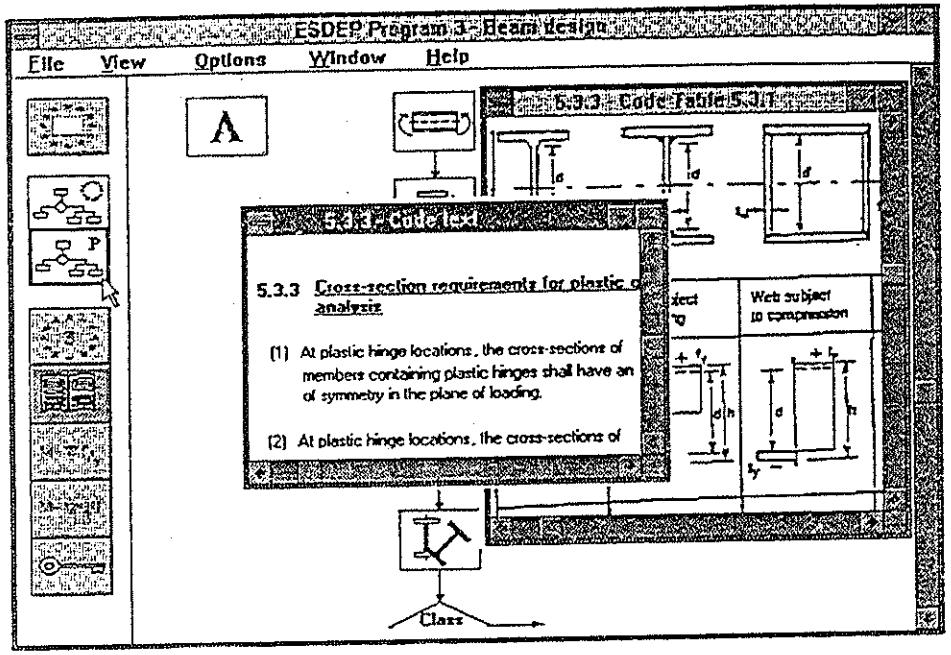
3. THE COMPUTER BASED TRAINING

The CAL committee has been established to assist the Advisory Committee in the aspects of the ESDEP program that relate to the computer based training. The committee plans and progress the work that produces computer learning material which is fully compatible with the Eurocode 3 and the rest of the ESDEP lectures. The CTU representative is Dr. Wald.

The committee selected media : minimum of a 386 computer with 4 Mb of RAM. It is envisaged that a minimum of 10 Mb of a hard disk space should be required. All interaction will go via a mouse. Screen solution will be minimum of VGA. The operating system is decided to be the DOS version 3 upwards. The software will be designed to run on the most widely used networks. The software will work within Microsoft Windows 3. Micon (the moving icon as a subset of a series of video frames) facilities will be provided and stored on a hard disk. Diagrams, photographs could be scanned for the integration into the application.

A set of icons was designed to active each of the basic lectures: Tension member, compression member, truss, beam, beam-column, frame, welded connection, bolted connection, composite member. This programs would each have series of screens for entering the input design data. Access could be made at any stage. A flow diagram enable to show the design process in the terms of process and decision boxes. Each box could also be accessed to gain more details and so a windows hierarchy was established. Other access buttons include: code clauses, code clauses clarifications, diagrams and tables, algorithms, calculations, Micons, illustrations. The ESDEP lectures will be referred to from the software and summaries may be incorporated into the software.

The QSE Ltd were selected as a software sub-contaractor. This enable to use one of the best active graphic available, the object-oriented language and first of all to encourage the maintenance of the software to stay alive.



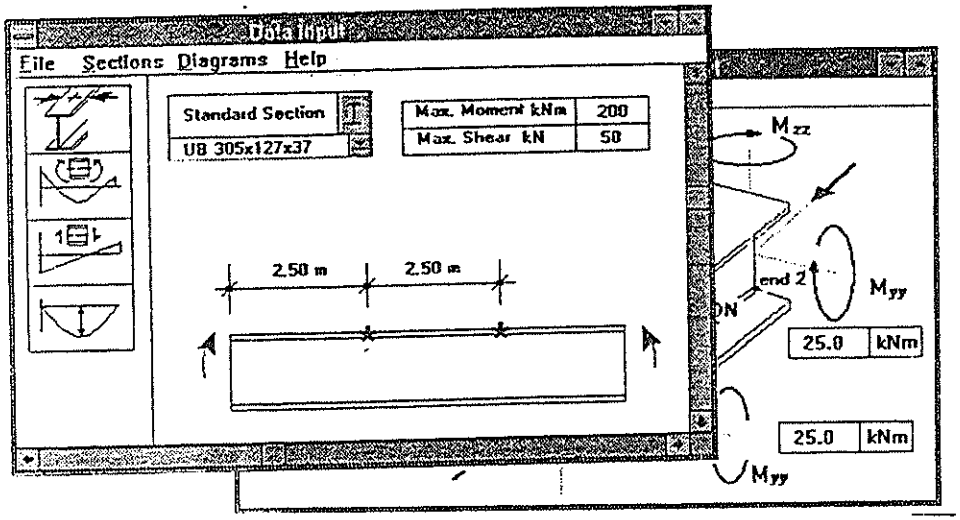


Fig.2 The Draft of Screen Representations, ESDEP - Program 3, Beam design, Version 1, Principles, D. Brohn, QLS Ltd, 1991.

4. CONCLUSION

The developing of new standard is only a part of introduction of new standard into the praxis. The important step seems to be to teach new possibilities of design modeling as well as to produce all materials for standards applications. This is the basic and expected role of the university and industry cooperation. The lack of information according the structural Eurocodes could lead to overestimating of its importance on the one hand and to expensive updating old materials on the other hand. The European small countries are basically more interest into structural Eurocodes progress.

The time of teaching nonprofessional software is over. The bases of today software are the professional prepared packages based on graphics inputs to be filled by each educator according basic overall but also local and special needs. This enable to use and develop each educator as well as students personality. The software maintenance is the basic unsolved question of most today CAL software.

The help of Western Europe Universities for the Czechoslovakian praxis through cooperation with the local Universities seems to be checked as productive idea.

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