

COMPUTER SOFTWARE FOR CARRYING OUT RISK ASSESSMENT IN THE IRON AND STEEL INDUSTRY

1. Case metadata

▪ ***Country/ies of origin:***

Turkey

▪ ***Year of publication by agency:***

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▪ ***Sector:***

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▪ ***Keywords:***

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24361C Good practice

08801A Risk analysis and management

43681D Computers

19641D Risk assessment

20641D Worker participation

2. Organisations involved

Ereğli Iron and Steel Works Co. / ERDEMİR

3. Description of the case

3.1. Introduction

ERDEMİR is an integrated steel mill which produces strip products. The Turkish company employs 7500 workers. There are 22 operational departments with a production site.

Steel making characteristically is a heavy industry, comprising many hazards and risks in the workplace. Among the most common causes of injury and illness in the iron and steel industry are: slips, trips and falls on the same level; falls from height; unguarded machinery; falling objects; working in confined spaces; moving machinery; on-site transport, forklifts and cranes; exposure to controlled and uncontrolled energy sources; inhalable agents (gases, vapours, dusts and fumes); skin contact with chemicals; contact with hot metal; fire and explosion; extreme temperatures; radiation (non-ionizing, ionizing); noise and vibration; electrical burns and electric shock; manual handling and repetitive work; etc.¹

¹ International Labour Organisation. ILO code of practice. Safety and health in the iron and steel industry. Second edition, 2005, Geneva. Available at: <http://www.ilo.org/public/english/dialogue/sector/techmeet/meisi05/code.pdf>.

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The management of risks is not a linear process; rather it is the balancing of a number of interwoven elements which interact with each other and which have to be in balance with each other. Where suppliers and/or partners are involved, it is important to gain a shared view of the risks and how they will be managed.

Considering the size of the company, it is very important that these occupational hazards and risks are identified and evaluated in a structured and uniform way. The results obtained by risk assessment are evaluated and analysed to improve work safety. The results are also used in other occupational health and safety processes like tracing health parameters, starting preventive actions, deciding personal protective equipments, etc. Risk assessment cards prepared in Excel or Word formats can mostly not meet the needed requirements.

3.2. Aims

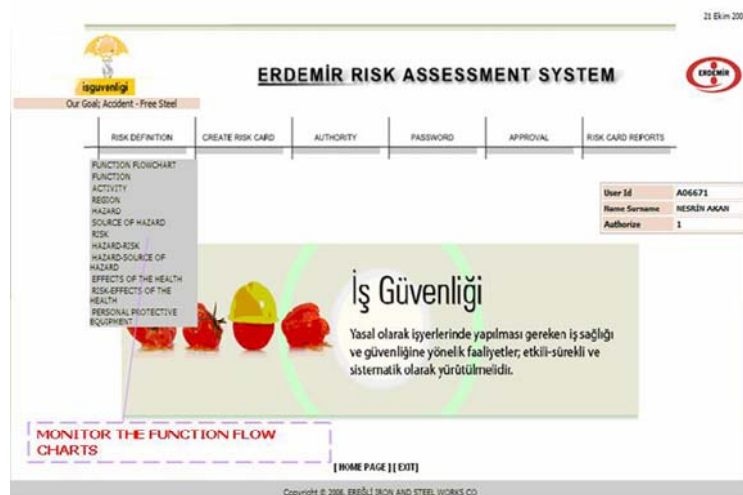
ERDEMİR aims to manage risk exposure by taking action to keep exposure to an acceptable level, and this in a cost-effective way. In order to do so, risk management at ERDEMİR involves having:

- up-to-date information about risks;
- decision-making processes supported by a framework of risk analysis and evaluation;
- processes in place to monitor risks;
- the right balance of control in place to deal with those risks.

3.3. What was done, and how?

ERDEMİR developed computer software to enable an effective online risk assessment. The ERDEMİR Risk Assessment Program (ERAS) software was developed by the firm's own software team. The system enables data analysis and traceability. In addition, the system is not found on a constant base; it was designed to enable permanent adaptations to different environment factors and conditions. Additions and subtractions can be made easily. Figure 1 shows the start page of the ERAS program, on which the following sections are displayed: 'Risk definition', 'Create risk card', 'Authority', 'Password', 'Approval', and 'Risk card reports'.

Figure 1. The start page of the risk assessment program ERAS



Source: ERDEMİR, 2008.

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ERAS has several parameters, which are hazards, sources of hazards, risks, working areas, risk level, health effects (acute, chronic), personal protective equipments, MSDS (Material Safety Data Sheet), teams of risk assessment, etc. The system can be adjusted according to those parameters. Furthermore, the system is able to take into account new working conditions, technologies and/or equipment, and the requirements of new workers or trainees. New hazards and risks can easily be added or changed. Figure 2 shows an example of a 'risk assessment card' with its different parameters, resulting from a risk assessment carried out in the ERAS program.

Figure 2. Example of a risk assessment card from ERAS

9 Ekim 2008

COKE PLANT											
NUMBER OF REVISION	FUNCTION FLOWCHART NAME	FUNCTION	ACTIVITY	REGION	UNIT OF	FAS	STATUS				
0 / 1704	PREPARING AND SENDING COKE	MOVING COKE FROM COKE BREAKER BY M1 CONVEYOR BELT	FOLLOWING AND CLEANING UNDER THE RAMP	RAMP	UNIT OF PREPARING COKE AND COAL		T				
HAZARD	SOURCE OF HAZARD	RISK	EXISTING PRECAUTION	P	I	RISK RATING (Probability * Impact) = (P) * (I)	NUMBER OF INJURY - DOCUMENT	EFFECT OF THE HEALTH - ACUTE	EFFECT OF THE HEALTH - CHRONIC	CORRECTIVE AND PREVENTIVE ACTION - DOFNO	PERSONAL PROTECTIVE EQUIPMENT
INDUSTRIAL DUST	DUST OF COKE	INHALATION	ON THE JOB TRAINING, INSTRUCTIONS, UNIT TRAINING SYSTEM	1	3	3	0	AKUT GAS INTOXICATION, HYPOVOLEMIA, HYPOXIA	LUNG CANCER	--	SAFETY HELMET, DUST RESISTANT GOGGLE, REFLECTIVE WORKWEAR, SAFETY BOOT, RESPIRATOR, NITRIL GLOVES
INDUSTRIAL DUST	DUST OF COKE	EXPLOSION	PERIODIC CLEANING	1	5	5	0	HYPOVOLEMIC SHOCK, TYMPANIC MEMBRAN DISORDER, MULTIPLE TRAUMA, AKUSTIC TRAUMA	AKUTE STRESS DISORDER	--	SAFETY BOOT, SAFETY HELMET, REFLECTIVE WORKWEAR, NITRIL GLOVES, DUST RESISTANT GOGGLE, RESPIRATOR
WORKING EQUIPMENT	LADDER	A TRIP AND FALL	PERIODIC CLEANING, LIGHTING CONTROL, INSTRUCTIONS, JOB SPECIFIC TRAINING, UNIT TRAINING SYSTEM	3	4	12	1	MULTIPLE TRAUMA, TRAUMA		APPLICATION OF SS - 299	SAFETY HELMET, SAFETY BOOT, REFLECTIVE WORKWEAR, DUST RESISTANT GOGGLE, RESPIRATOR
RISK ASSESSMENT TEAM								APPROVED BY		APPROVED BY (UPPER)	
UNIT OF WORKER1	UNIT OF WORKER2	ENGINEER	OHS ENGINEER	MEMBER OF HEALTH SERVICE	OCCUPATIONAL SAFETY DEPARTMENT	CHIEF	MANAGER				
MÜDAT NECİP	KENAN UZUN	ÇETİN GÜREL	HAKAN TANIŞIK	YALÇIN KARAKAŞ	HAYRİ DEMİRCİ	HASAN AKBULUT	HAKAN NİZAMETTİN TANIK				

Example : Risk Assessment Card

[HOME PAGE] [EXIT]

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Source: ERDEMİR, 2008.

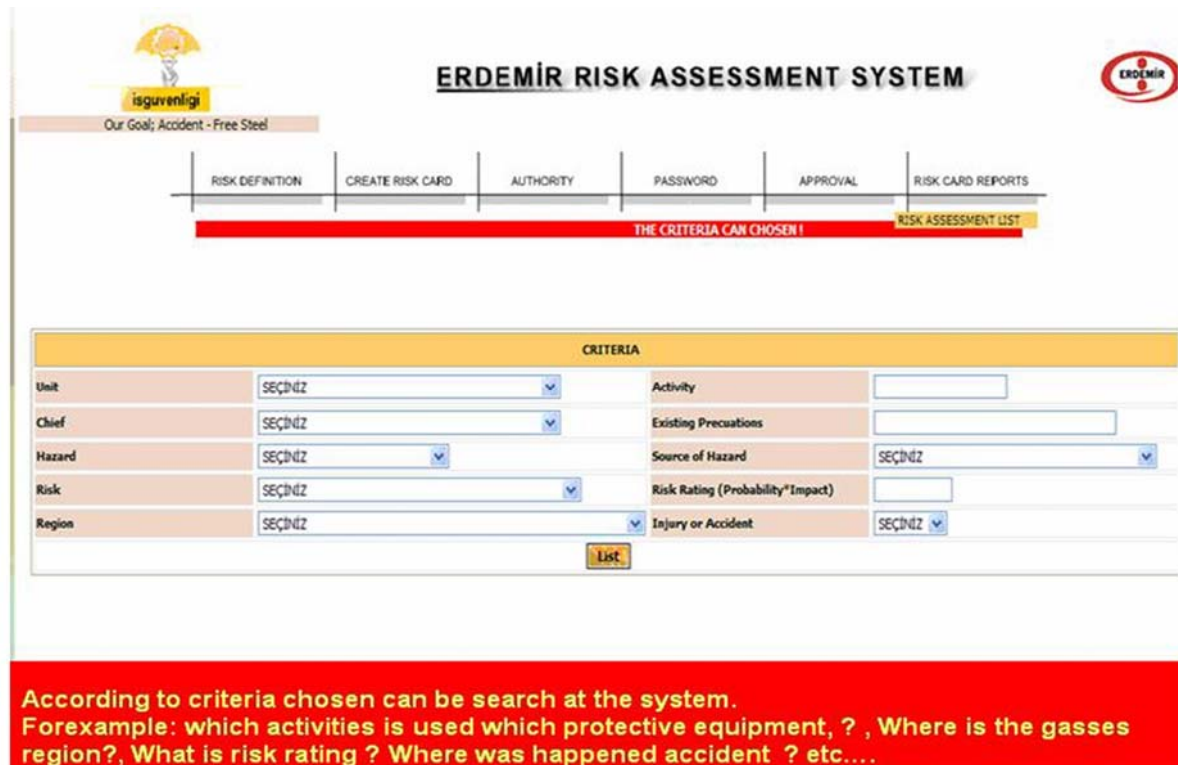
The assessment of identified risks is done in ERAS by determination of risk levels (risk classification). These risk levels are a multiple of the likelihood (probability of occurrence) and the severity of risks. For both factors (likelihood and severity), there is scale of five degrees. The minimum risk level is thus one; the maximum risk level is 25. Priority preventive actions are taken based on these risk classifications.

Risk assessment at ERDEMİR is done by specific risk assessment teams. Each unit has such a risk assessment team, which consists of five workers from the unit concerned.

The ERAS system enables easy searches and provision of procedures, instructions, required personal protective equipment, training booklets, information on past accidents, former prevention measures, etc. Figure 3 shows the search function of the ERAS program, with the different criteria that can be searched on in the system.

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Figure 3. Search function of ERAS



ERDEMİR RISK ASSESSMENT SYSTEM

Our Goal; Accident - Free Steel

RISK DEFINITION | CREATE RISK CARD | AUTHORITY | PASSWORD | APPROVAL | RISK CARD REPORTS

THE CRITERIA CAN CHOOSE I | RISK ASSESSMENT LIST

CRITERIA	
Unit	SEÇİNİZ
Chief	SEÇİNİZ
Hazard	SEÇİNİZ
Risk	SEÇİNİZ
Region	SEÇİNİZ
Activity	
Existing Precautions	
Source of Hazard	SEÇİNİZ
Risk Rating (Probability*Impact)	
Injury or Accident	SEÇİNİZ

List

According to criteria chosen can be search at the system.
Forexample: which activities is used which protective equipment, ? , Where is the gasses region?, What is risk rating ? Where was happened accident ? etc....

Source: ERDEMİR, 2008.

3.4. What was achieved?

An online software for risk assessment – ERAS – was developed by ERDEMİR's own software team. Since the introduction of this risk assessment software, it has been much easier to determine risks and risk levels, and to take corrective actions. Moreover, in order to prevent occupational diseases, workers can be swapped between different units for specified periods. Parameters of the program are determined by the experts so that the same definition and terminology is used for every unit. This system can be accessed by all workers at any time. It has also contributed to a reduction in costs incurred for accidents and occupational illnesses.

3.5. Success factors

The success factors of using online computer software for risk assessment activities, are amongst others the following:

- easy sorting and analysis of risk assessment data;
- adaptability of all parameters in the system;
- determination of programme parameters by experts so that the same definitions, terminology, and risk rating system are used for risk assessment activities in every unit;
- ability to ensure effective risk assessment for activities which show a variable character (the production in the operational units continues for 24 hours);
- easy risk analyses and revisions due to the guidance of the software to the system administrators, assessments with the workers, and traceability of the data;

- easy adaptation of the system to changes in Legal Requirements and Standards;
- accessibility of the system by all workers at any time, which enables the sharing of experiences and thus increases sensitivity with regard to occupational safety and health;
- fast identification of hazards/hazard sources, risk concepts and health effects (acute/chronic), and fast analysis of risks;
- easy risk assessment of chemicals and chemical compounds;
- quick provision of Material Safety Data Sheets (MSDS) of chemicals and chemical compounds;
- easy information gain by users, in order to give safety training to workers;
- easy search and provision of procedures, instructions, required personal protective equipment, training booklets, information on past accidents, former prevention measures;
- user warning if inadequate or wrong information is introduced.

3.6. Further information

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3.7. Transferability

A software programme, such as ERAS, enabling the online assessment of occupational risks, is easily transferable to other countries, sectors and companies. An online software programme can especially be useful in larger companies, so that occupational hazards and risks can be identified and evaluated in more a structured and uniform way.

4. References, resources:

- Information provided by the company in the framework of the Good Practice Award Competition 2008/2009
- ERDEMİR website: <http://www.erdemir.com.tr>
- News release on ERDEMİR website 'ERAS Software was selected as a commended entry in the 9. European OHS Good Practice Competition':
<http://en.erdemir.com.tr/Media/detail.aspx?SectionID=PXMIxQx4Q1iatYVmCYNgfA%3D%3D&ContentID=ESHKfPoE5vFNO9qtrDJarA%3D%3D>
- International Labour Organisation. ILO code of practice. Safety and health in the iron and steel industry. Second edition, 2005, Geneva. Available at:
<http://www.ilo.org/public/english/dialogue/sector/techmeet/meisi05/code.pdf>