



THE BRAZILIAN AGGREGATES INDUSTRY

SAFETY & HEALTH IN THE BRAZILIAN MINING INDUSTRY



WHAT ANEPAC IS AND DOES

ANEPAC represents nationally regional and states associations of sand and crushed stone producers.

ANEPAC actions are financially supported by these associations and by voluntary contribution of major aggregates producers.

ANEPAC acts for assuring aggregates industry interests in Congress, in states legislative houses, in offices that enforces mining, environment, safety & health, labor laws and regulations.

ANEPAC edits a magazine (Areia & Brita)

Brazil in Figures

	2000	2005	2010
Population (million)	174.1	186.8	193.3
Population Growth Rate	1.5	1.4	1.2
Gross Domestic Product (US\$ billion)	644.5	882.5	1,654
Evolution of Gross Domestic Product	4.3	2.9	5.1
Inflation Rate	6.2	7.5	4.5 ²
Cement Consumption (million metric tons)	39.7	37.7	55
Concrete Consumption (million m ³)	50.9	48.3	70.5
Aggregates Consumption (million metric tons)	257	331	493 ¹

Source: IBGE, DNPM, Anepac

¹ Anepac

² Brazilian Central Bank

**Area: 8.5 million
km²**

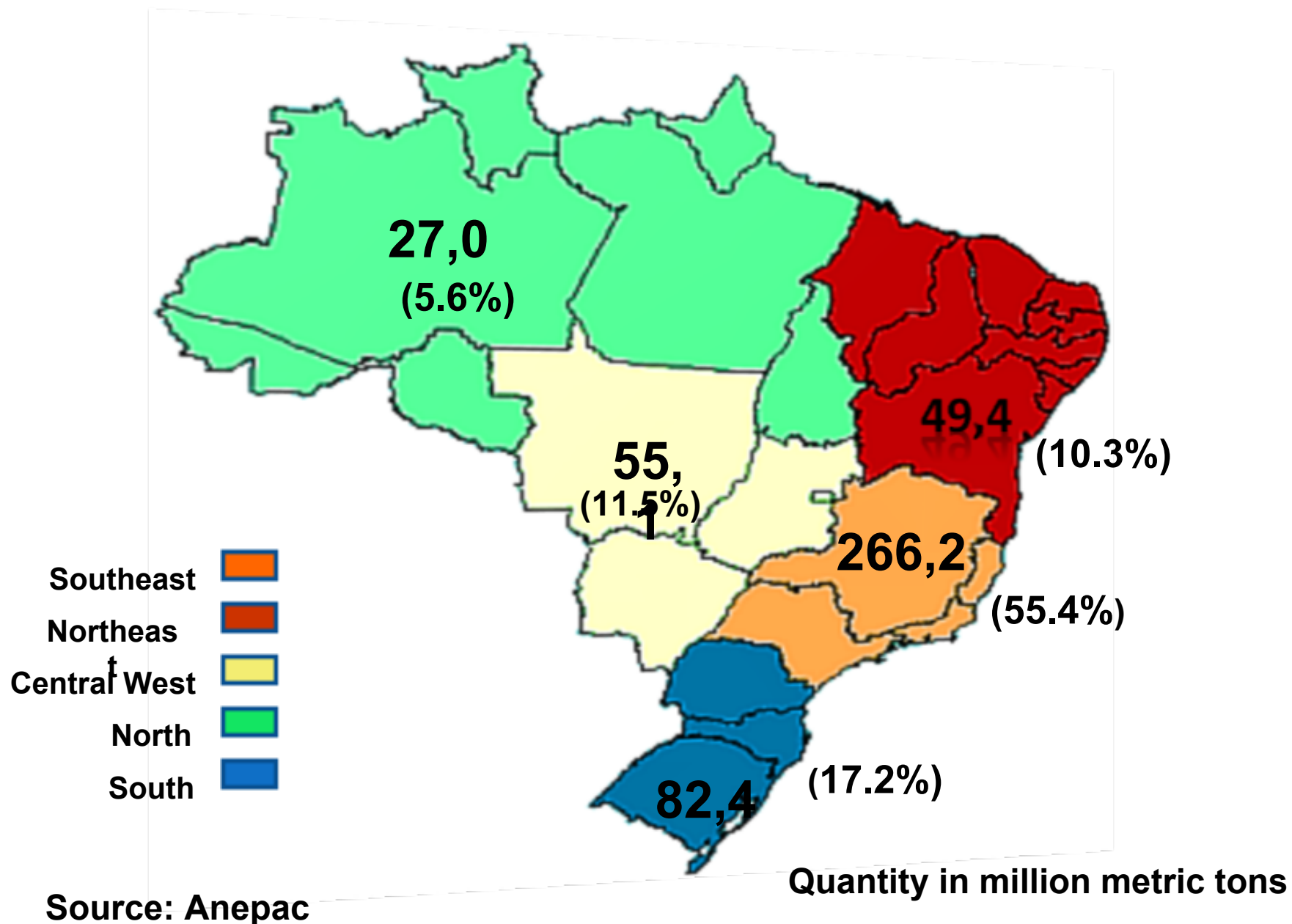
2009 Quick Summary of the Brazilian Aggregates Industry

	Sand	Crushed Stone	Aggregates
Production (t.10 ⁶)	289	192	481
Per Capita	1.5	1.0	2.5
Operations	2,500	600	3,100
Distribution (tpm)	60%: 1,500 – 10,000 35%: 10,000 – 25,000 5% >25,000	60% <20,000 30%: 20,000 – 40,000 10% >40,000	
Employees	47,000	21,000	68,000
Total Revenue ¹ (US\$ bilhão)	2.22	2.38	4.60

Source: Anepac

¹ Total value of material f.o.b. plant

Brazilian Aggregates Production by Region 2009



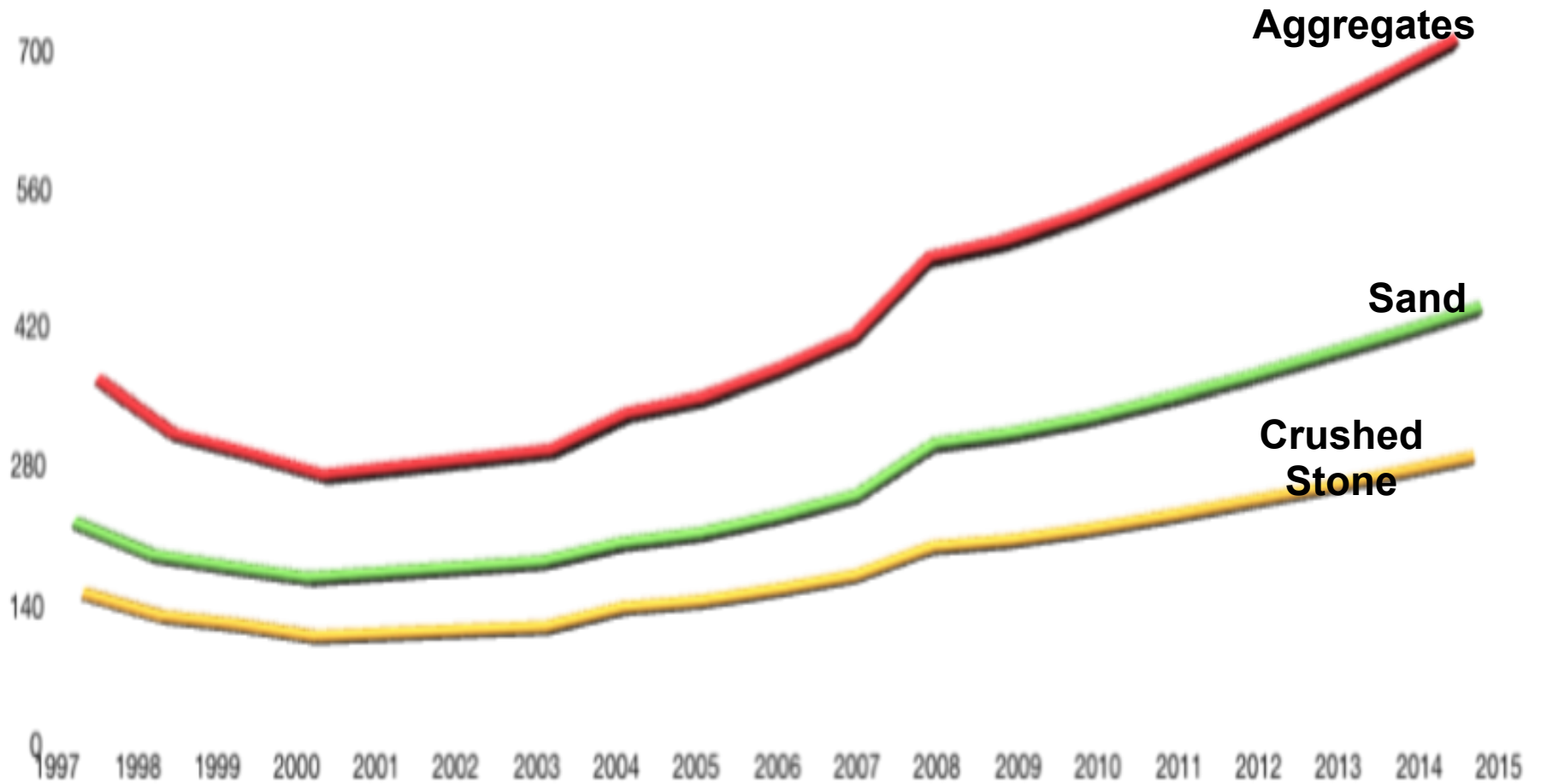
2009 Aggregates Market Segmentation

Stone (%) Segment Sand(%)		
32	Ready Mixed Concrete	20
24	Construction Companies	15
14	Prefabricated industries	10
10	Sellers/Shops	10
9	Asphalt plants	5
7	Government	3
4	Others	2
—	Mortars	35

Source: Anepac

Brazilian Aggregates Production Forecast

(Million Metric Tons)



Demand Outlook (1997 – 2015)

● Growth Consumption

- 2007: aggregates production reached 390 Mt;
- 2008: 19% growth;
- 2009: 3.4% growth;
- 2010: projected a 5% growth;
- Over the next 5 years: projected an average annual growth rate of 6%.

○ Production Capacity

- 1998 up to 2004: decrease due to lack of investment;
- 2005 up to 2007: investments on new equipments and new plants;
- 2008: production capacity estimated at 520 Mt;
- 2009: production (481 Mt) achieved 92% of the production capacity.

○ If

OCCUPATIONAL HEALTH AND SAFETY PROGRAM IN MINING IN BRAZIL

- ANEPAC has not his own OH&S program
- IBRAM (Brazilian Mining Institute) represents the mining industry and has as its associates mining companies and mineral producers associations as ANEPAC.
- **MINER AÇÃO** – It is the name IBRAM adopted for Occupational Health & Safety program. Mineração is mining in Portuguese; Ação is action in Portuguese.
- The program is being structured by IBRAM and the following slides is being presented at events by IBRAM's staff.



MINERAÇÃO

OCCUPATIONAL HEALTH AND SAFETY PROGRAM IN MINING IN BRAZIL

NOTES

INSS – National Institute of Social Security – It pays retirement pensions; it also pays a salary to workers who have accidents or diseases and cannot work for a period of time (first 15 days – company; more than 15 days – insurance); workers should be examined by an official physician; than it also collects data on accidents at the work place and occupational diseases and publishes statistics annually.

MTE – Ministry of Labor – it enforces legislation about labor.

ABNT – Brazilian Technical Standards Association – sets standards

NBR – Brazilian Standard



MINERAÇÃO

OCCUPATIONAL HEALTH AND SAFETY PROGRAM IN MINING IN BRAZIL

NOTES

OIT – International Labor Organization

DNPM – National Department of Mineral Production – it enforces the Mining Law; collects statistics of the mining industry

FAP (Accident Prevention Factor) – This factor verifies the performance of a company within their economic activity for accidents occurring in a given period. The FAP is a multiplier that varies from 0.5000 to 2.0000.

SAT/RAT – It is a contribution (tax) paid by a company to finance insurance paid to workers that cannot work due to an accident and consists of percentage that measures the risk of the economic activity. SAT/RAT: 1% (minimal risk); 2% (medium risk) and 3% (serious risk).

It is applied over the total amount of wages and salaries paid by the company in a month.

SAT – Working Accidents Insurance RAT – Working Environment Risk

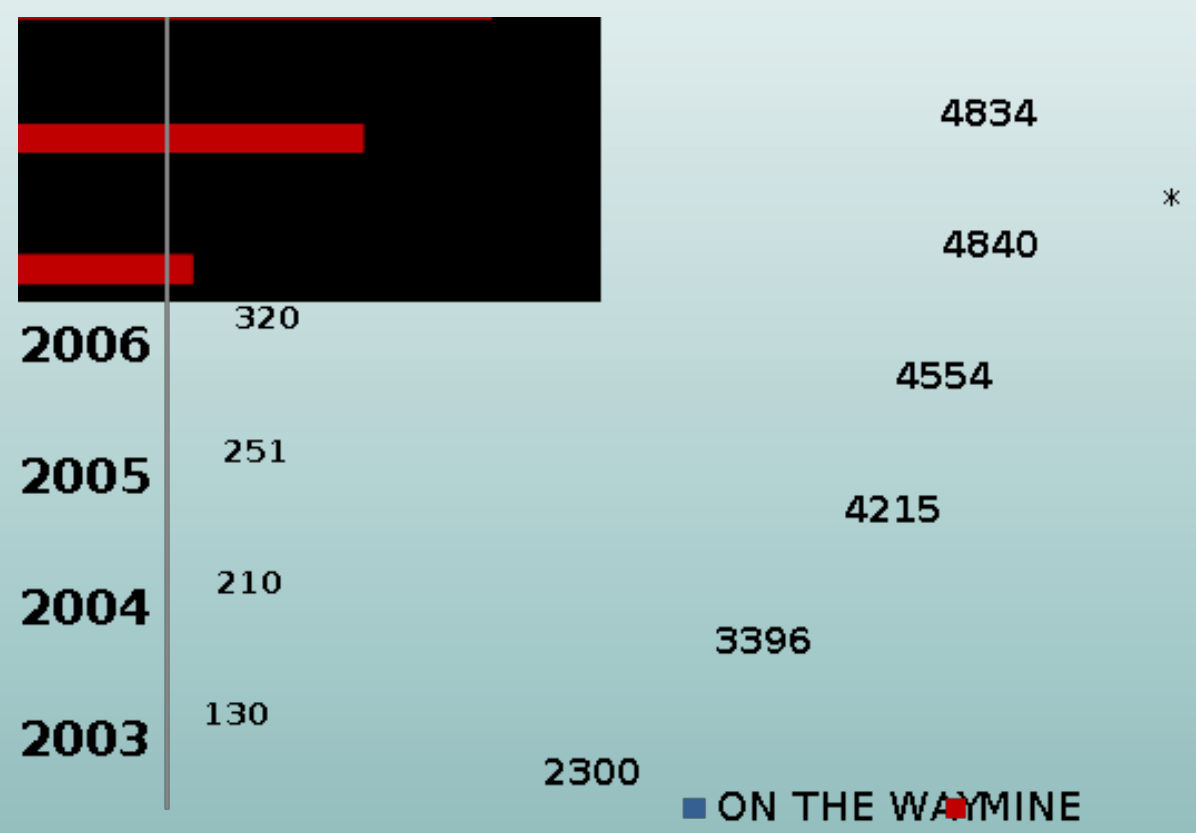


MINERAÇÃO

OCCUPATIONAL HEALTH AND SAFETY PROGRAM IN MINING IN BRAZIL

Managing risks is looking to the future...

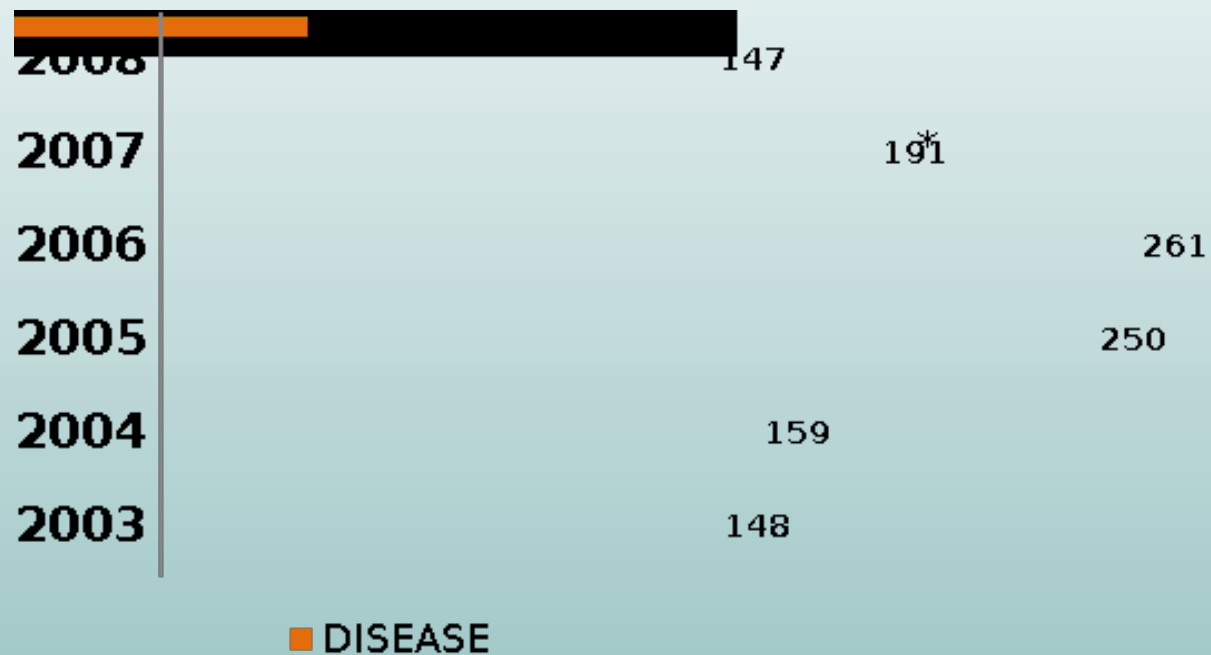
ACCIDENTS IN MINING - BRAZIL



Social Security Statistical Yearbook

* NTEP / INSS

OCCUPATIONAL DISEASES IN MINING - BRASIL



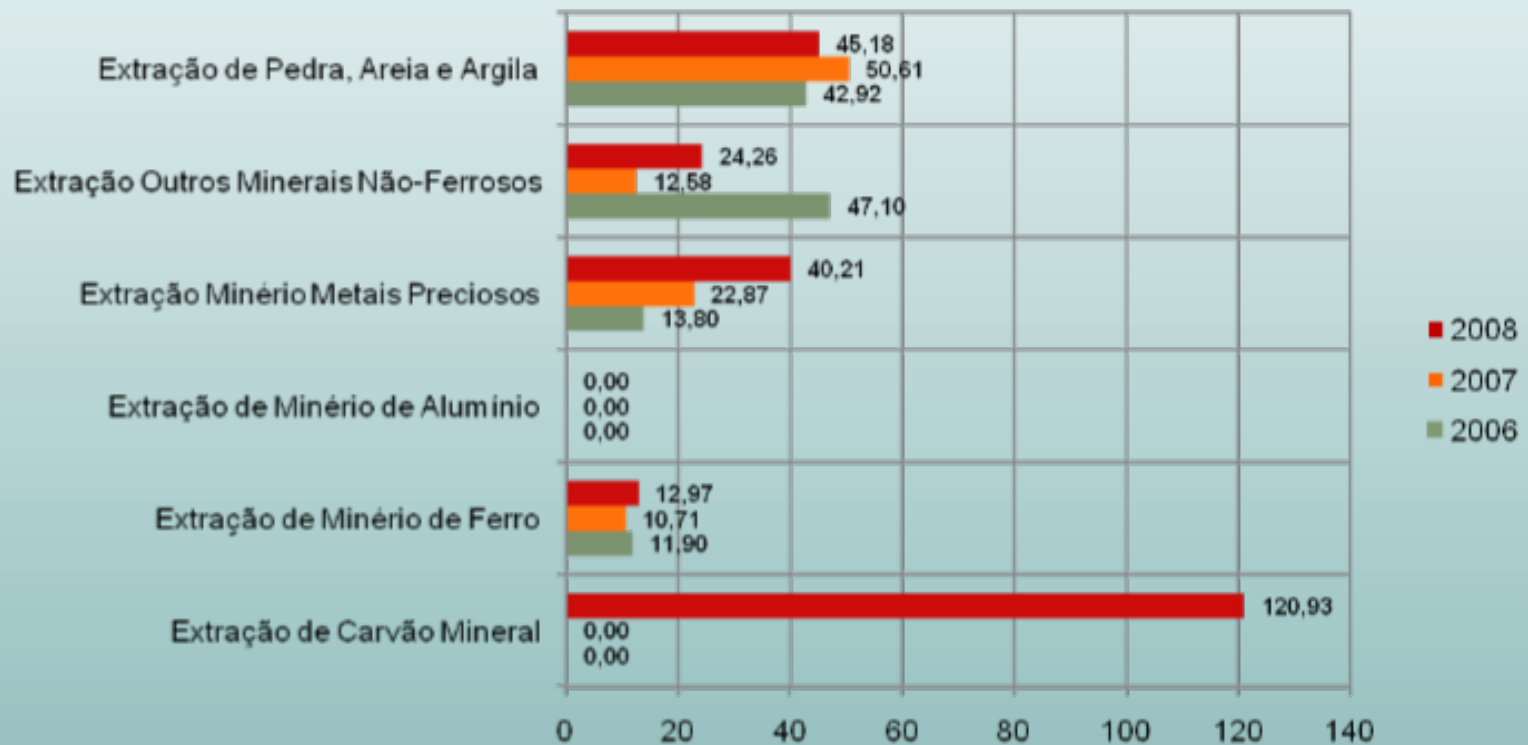
Social Security Statistical Yearbook

* NTEP / INSS

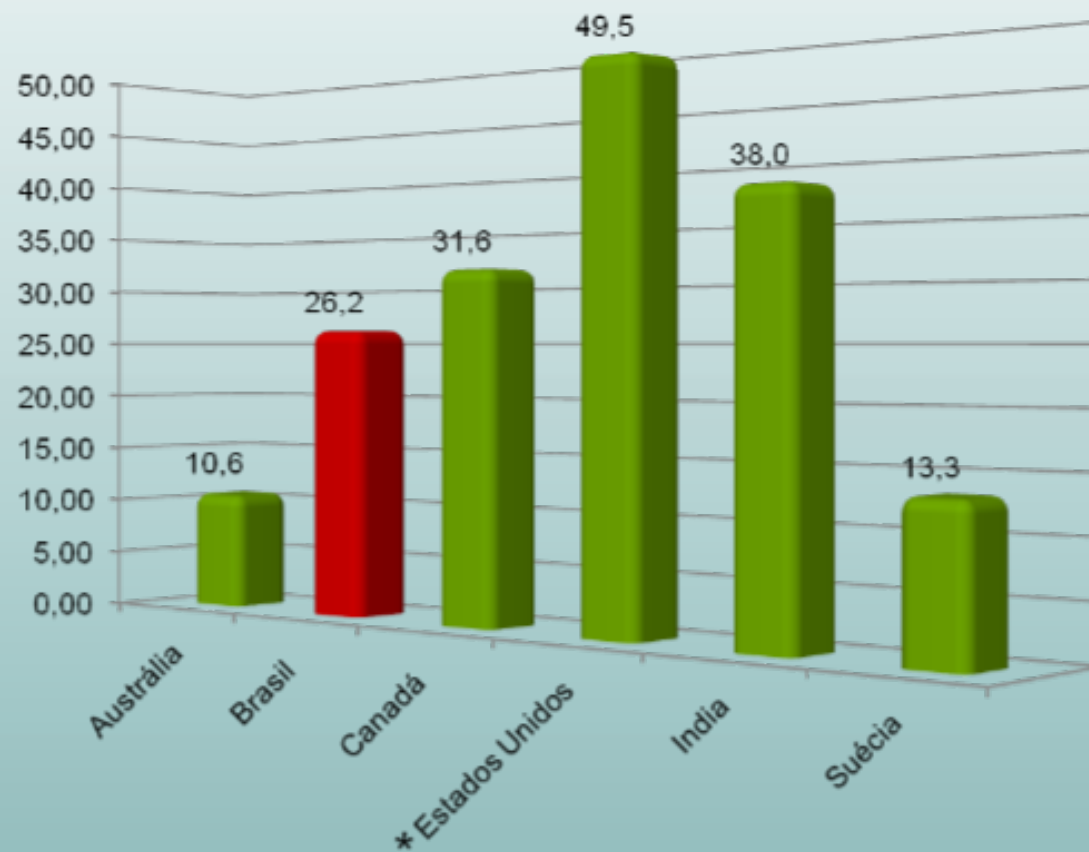
FATALITY RATE BY MINERAL CLASS – BRAZIL / 2006 - 2008

MINERAL CLASS	2006	2007	2008
Stone, Sand & Gravel, Clay	42.92	50.61	45.18
Other Non-ferrous Minerals	47.10	12.58	24.26
Precious Metals	13.80	22.87	40.21
Alluminium	0.00	0.00	0.00
Iron	11.90	10.71	12.07
Coal	0.00	0.00	3

FATALITY RATE BY MINERAL CLASS – BRAZIL / 2006 - 2008



FATALITY RATE BY COUNTRY / 2006



INSS – Social Security Statistical Yearbook/ OIT – International Labor Organization / Bureau of Labor Statistics

* USA – 2005 = 26,80 / 2007= 24,8 – 2006 = Sago Mine Disaster

ACCIDENTS – HOW MUCH THEY COST

DIRECT COSTS: medical expenses, days lost, fines, ...

INDIRECT COSTS □ High

- loss of materials
- loss of equipments
- loss of production
- loss of market share
- **IMAGE** – loss of prestige
- higher insurance preminum
- criminal/civil suit expenses, payments to lawyers

GOVERNAMENTAL ACTIONS

- **Mineral Production Department-DNPM/Ministry of Labor-MTE:**
 - NRM-22** □ **Workers Protection Rules.**
 - NR-22** □ **Risk Management Program**
- **Social Security Institute-INSS / MTE Partnership:**
 - SIRENA PROJECT - MTE** □ **Regressive Actions - INSS**
- **Labor Public Prosecutor's Office:**
 - Makes companies, associations, etc. sign agreements to achieve goals**
- **National Institute for Social Security - INSS:**
 - FAP = 0,5% a 6%** □ **SAT - RAT = 1%, 2%, 3%**
 - FAP (Accident Prevention Factor)**
 - SAT – Working Accidents Insurance**
 - RAT – Working Environment Risk**

PROGRAM MINERAÇÃO- WHY?

- **Develop preventive management and culture in mining companies;**
- **Use advanced technological resources on Occupational Safety and Health issues;**
- **Keep track of new legal regulations and enforcement policy by OSH offices;**
- **Disseminate and share information on Good Practices ;**
- **Build mining industry's Database and Statistics on OSH;**
- **Demonstrate commitment to social responsibility and sustainable development;**
- **Get for the mining industry a better image on OSH issues.**

GOAL

“Being seen as the Industry which gets the Best Results on Occupational Safety and Health in Brazil”.



CHALLENGE!!

TEN PRINCIPLES OF THE PROGRAM

First Principle: Act permanently in order to minimize risks to health and safety of persons working in mining activities.

Second principle: Make known, in all the hierarchical levels, that safe behavior depends on the commitment of everybody.

Third principle: Encourage mining companies, regardless of its size and management systems, to participate voluntarily in the program.

The fourth principle: Unrestricted support of the Brazilian OS&H legislation and commitment to the principles of ICMM-International Council of Mining and Metals in regard to occupational safety and health.

Fifth Principle: Emphasize that safety and healthy working environment should be present at all stages of the project.

TEN PRINCIPLES OF THE PROGRAM

Sixth principle: Promote broad, constant and continuous exchange of experiences and good practices across the mining industry (and stakeholders), using appropriate means of communication.

Seventh principle: Encourage the development of people (employees, contractors, partners and stakeholders) through education and training.

Eighth principle: Verify and measure performance and improvement, build database of mining industry indicators and disseminate them.

Ninth principle: Encourage the development of management and culture in occupational health and safety and improve facilities and equipment for safety and health of persons.

Tenth Principle: Promote the continuous improvement of occupational safety and health.

STRUCTURE of MINERAÇÃO

- **CONTENTS:** topics chosen by mining companies – GTT (Working Party)

GTT 01 – Legislation □ systematic monitoring of bills on OH&S issues in Congress and Senate

GTT 02 – Risk Management/Culture Program on OH&S

GTT 03 – Emergency Procedures / Investigation and Analysis of Accidents in Mining

GTT 04 – Critical Issues: Working at Height, Electricity, Vehicle Use (Traffic/Transportation), Confined Spaces, Explosives, Wall/Bench/Roof Stability, Underground works.

GTT 05 – Hygiene and Occupational Health

GTT 06 – Contractors Management

WHAT EACH GROUP IS DOING

- **GTT 01 – Legislation**

What is ready:

- monitoring bills on OS&H issues in Congress and Senate and communication of their progress
- legal information database/Glossary
- website IBRAM-restricted area

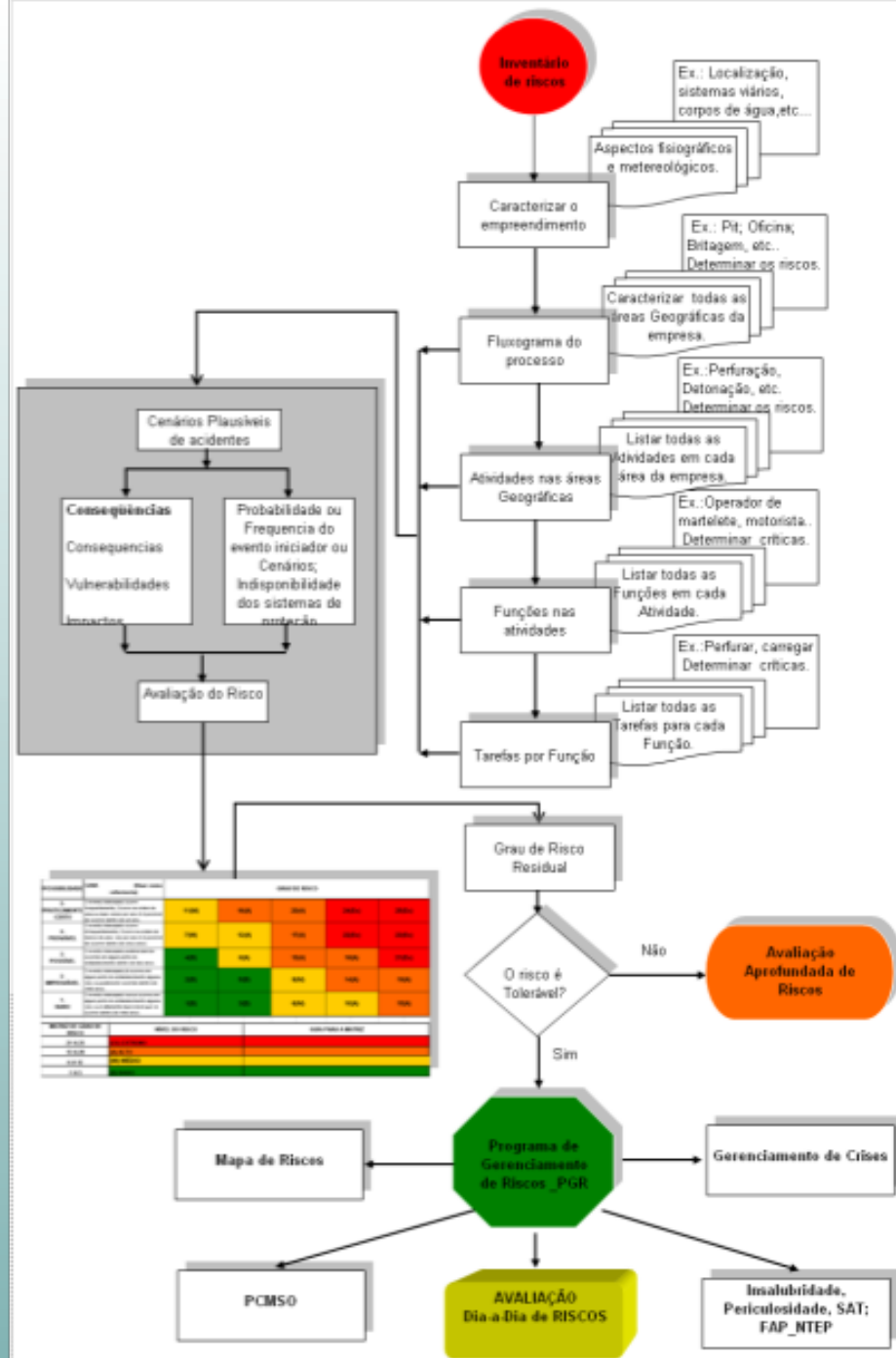
● **GTT 02 – Risk Management/Culture Program / OH&S**

What is ready:

- Flowchart - risk management system
- Risk Inventory– Risk Matrix
- Risk analysis
- Risk Evaluation
- Terminology and definitions of risk management/OH&S.

In Development:

- Risk management: developing final checklist.



- **GTT 03 – Emergency Procedures / Investigation and Analysis of Accidents in Mining**

What is ready/done:

- "Preparation and Response to emergencies"- Protocol and checklist.

- "Investigation and Analysis of Accidents"- Protocol and checklist.

- Technical visits:

AngloGoldAshanti-MG (gold)

Sama-GO (asbestos)

Mineração Santiago-MG (gneiss);

● **GTT 04 – Crítica Issues**

What is ready:

“Working at Height”- Protocol and checklist.

“Electricity”-Protocol and checklist.

“Vehicle Use (traffic/transport) ”- Protocol and checklist.

“Confined spaces”: Protocol

In Development:

“Confined spaces”: checklist

“Explosives”: Protocol and checklist.

Pending:

Stability

Protection of machinery and equipment

Handling and lifting /transport of materials

Underground works

- **GTT 05 – Hygiene and Occupational Health**

What is ready:

“Risk management in occupational health and hygiene”- Protocol and checklist.

“PCMSO”- Protocol and checklist

- **GTT 06 – Contractors Management**

What is ready:

“Contractors Management”: Protocol and checklist

Pending:

formatting and revision

STRUCTURE OF MINERAÇÃO

- **Evaluation System:**
 - short term: self evaluation – questionnaire of survey
 - long term: external evaluation
- **CLASS OF COMPANIES:**

Classification		Goals
Level 1	Beginner	Follow Brazilian rules - meet national legal requirements
Level 2	Intermediate	Meet regulations and standards of international organizations.
Level 3	Advanced	Prove continuous improvement in OS&H issues by reliable and known indices fixed by IBRAM; proof of zero cases of fatality or permanent disabilities during that period.
Level 4	Excelency	Have as a aim the best proctices and level of excelency.

PERFORMANCE INDICATORS

Adopt usual indicators – INSS - ABNT/NBR 14.280:

frequency rate: $N \times 1.000.000/H$ □ N = men injured in period;

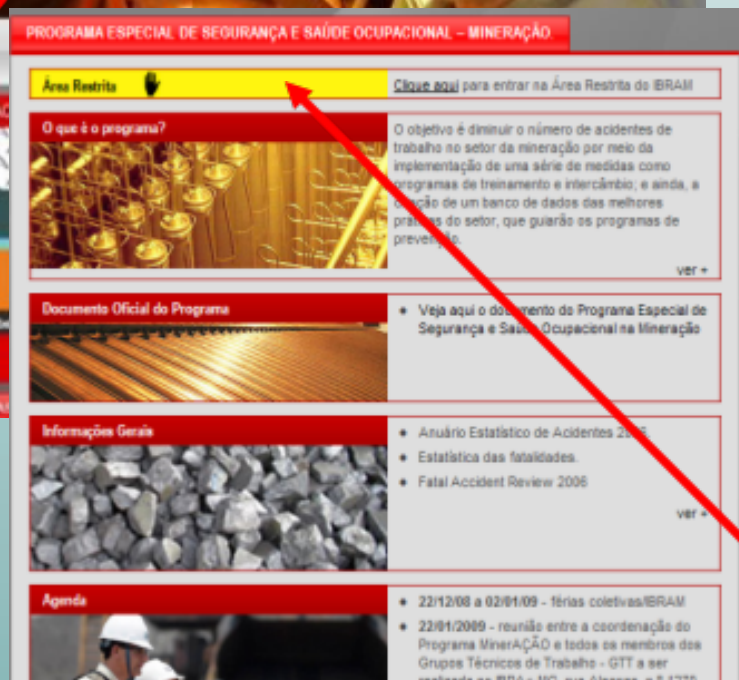
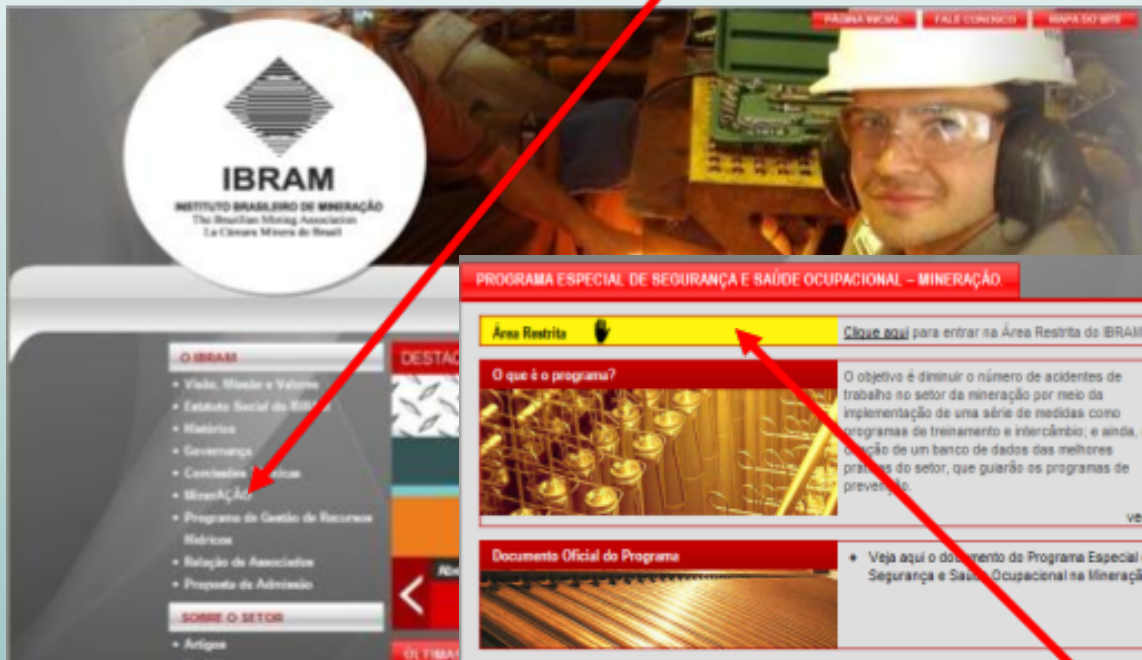
H = man-hours of exposure to risks

severity rate: $T \times 1.000.000/H$ □ T = total time (days lost); H = man-hours of exposure to risk

Fatality rate: total of deaths $\times 100.000$ /total of job in the industry

IBRAM ACTIONS - COMUNICATION

website: www.ibram.org.br/MINERAÇÃO



HEADLINES

- What is MINER AÇÃO?
- Documents
- Agenda – informations
- Partners
- Transcripts of Seminars and Lectures
- Accidents Indicators
- Form to adhering to the Program
- Supporting companies
- Access to restricted areas

Restricted Area



IBRAM
INSTITUTO BRASILEIRO DE MINERAÇÃO
The Brazilian Mining Association
La Cámara Minox de Brasil

Programa Especial de Segurança e Saúde Ocupacional da Mineração

| Home | Indicadores de Acidentes | Seminários e Palestras |

Cadastro de Dados

CHAT
Patricia de M...
Bepata
Acessar Chat

GTTs - Grupos Técnicos de Trabalho

- GTT 1: Legislação
- GTT 2: Programa de Gestão de Riscos / Cultura em Saúde e Segurança do Trabalho
- GTT 3: Preparação e Atendimento às Emergências/ Investigação e Análise de Acidentes
- GTT 4: Processos Críticos
- GTT 5: Higiene e Saúde Ocupacional
- GTT 6: Gestão de Contratadas

Legislação

Reunião Geral

Calendário das Reuniões

- **Registration – preliminary assessment - Database**

- **Chat**

- **GTT:
-Meeting Minutes**

- **Legislation (IUS Natura)**

- **Meeting Callendar**

- **General Meetings**

Database: OCCUPATIONAL ACCIDENTS DATA Software

- *Access to supporters*

The screenshot shows a web browser window displaying the website of the Instituto Brasileiro de Mineração (IBRAM). The browser's address bar shows the URL <http://www.programamineracao.org.br/>. The website header features the IBRAM logo and the text "PROGRAMA ESPECIAL DE SEGURANÇA E SAÚDE OCUPACIONAL DA MINERAÇÃO". Below the header is a navigation menu with options like "Página", "Segurança", and "Ferramentas". The main content area is titled "ÁREA RESTRITA" and contains a login form. The form includes instructions in Portuguese: "Para o 1º acesso, [clique aqui e cadastre-se](#), preenchendo o formulário na sua totalidade. Ao finalizar o preenchimento, clique em Enviar. Caso já tenha se cadastrado, informe o e-mail e senha abaixo para acessar os questionários." The form has two input fields: "E-mail:" with the value "teste@ibram.org.br" and "Senha:" with masked characters. Below the fields is an "Entrar" button and a link for "Esqueci minha senha". At the bottom of the page, there is contact information: "SHIS QL 12 - CONJ. 0 (zero) - CASA 04 - CEP: 71.630-205 - Brasília/DF (61) 3364-7272 / 3364-7200". The Windows taskbar at the bottom shows the "Iniciar" button and several open applications.

- Access to supporters: how to fill the forms

The screenshot shows a web browser window titled "IBRAM - Instituto Brasileiro de Mineração - Windows Internet Explorer". The address bar displays "http://www.programamineracao.org.br/". The page header features the IBRAM logo and the text "PROGRAMA ESPECIAL DE SEGURANÇA E SAÚDE OCUPACIONAL DA MINERAÇÃO". Below the header is a navigation menu with options like "Página", "Segurança", and "Ferramentas".

The main content area is divided into sections:

- INSTRUÇÕES INICIAS**
- CADASTRO**

Utilize a opção "Alterar Dados" em Cadastro, no menu lateral, para modificar as informações da empresa cadastrada e inclusive mudar o e-mail e senha de acesso.
- QUESTIONÁRIO**

Para responder os questionários, clique sobre o respectivo ano no menu lateral e siga as instruções de preenchimento.

Os anos com o ícone  ao lado são novos questionários e tem nenhuma questão respondida.

Os anos com o ícone  ao lado já foram respondidos parcialmente ou totalmente, mas ainda não foram enviados.

Os anos já respondidos e enviados terão o ícone  ao lado. Questionários enviado podem ser consultados, mas não podem ser alterados.

The footer contains the address: "SHIS QL 12 - CONJ. 0 (zero) - CASA 04 - CEP: 71.630-205 - Brasília/DF (61) 3364-7272 / 3364-7200". The Windows taskbar at the bottom shows the "Iniciar" button and several open applications.

- Access to supporters: how to fill the questionnaires



IBRAM - Instituto Brasileiro de Mineração - Windows Internet Explorer
 http://www.programamineracao.org.br/

MINERAÇÃO PROGRAMA ESPECIAL DE SEGURANÇA E SAÚDE OCUPACIONAL DA MINERAÇÃO

Boas tarde, Patricia [Sair](#)

QUESTIONARIO 2008 [Salvar](#) [Enviar](#)

Ir para: [Instruções](#) [Etapa 1](#) [Etapa 2](#) [Etapa 3](#) [Etapa 4](#) [Etapa 5](#) [Etapa 6](#) [Etapa 7](#)

3 - EMPREGADOS PRÓPRIOS

RESUMO DE INFORMAÇÕES SOBRE ACIDENTES DO TRABALHO EMPREGADOS PRÓPRIOS

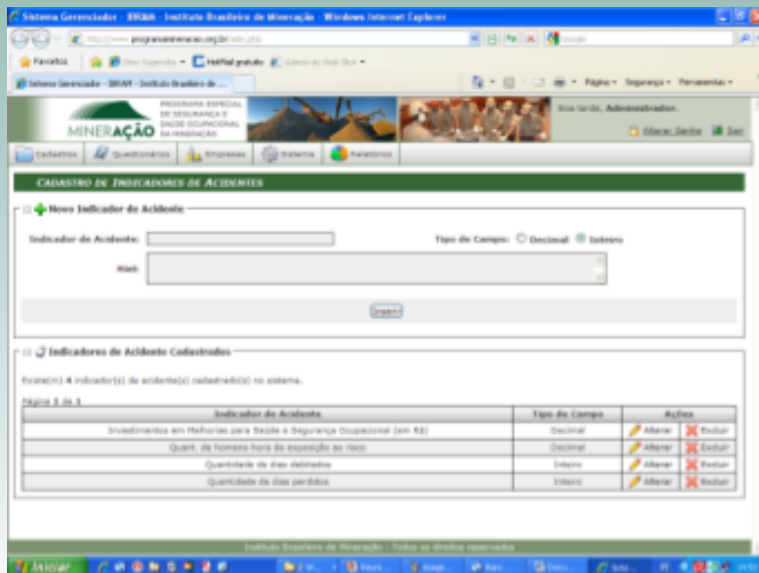
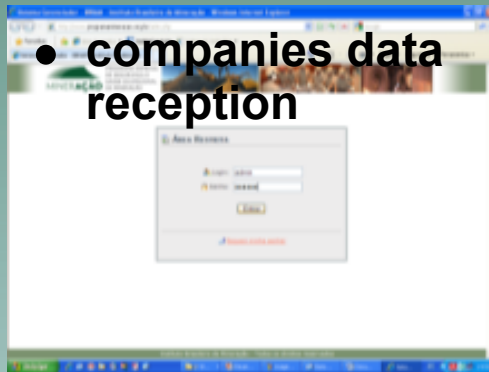
Acidentes	Qtde
Acidente tipo com afastamento (> que 01 dia) ▼	
Acidente tipo sem afastamento ▼	
Doenças Ocupacionais ▼	
Fatais ▼	
Trajeto ▼	
Total	0

[Anterior](#) [Próxima](#)

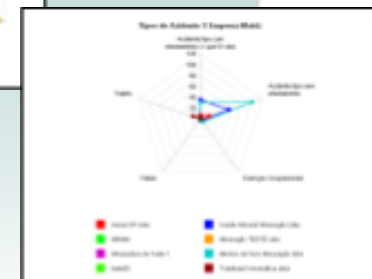
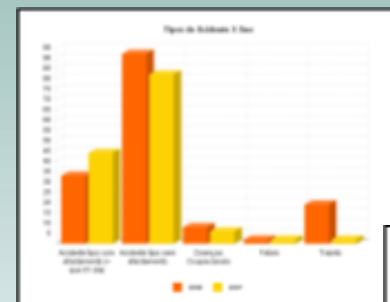
Iniciar 2 W... Reuni... Image... Banc... Docu... IERA... PT 14:40

- Access IBRAM Data Management:

- restricted access: IBRAM
- create / change questionnaire
- companies data reception



- produce graphical / numerical reports:



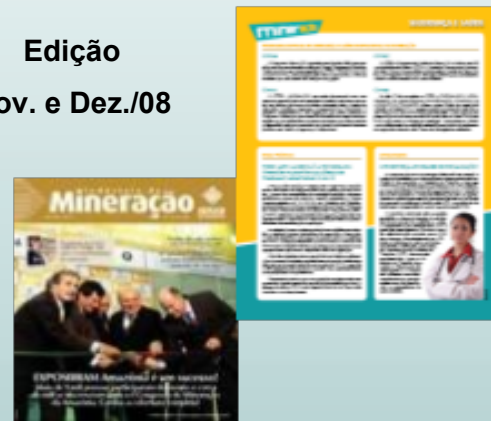
Communication Network

Newspaper – Indústria da Mineração

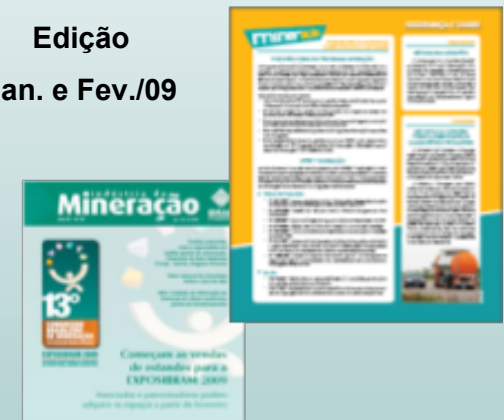
Edição
Setembro/08



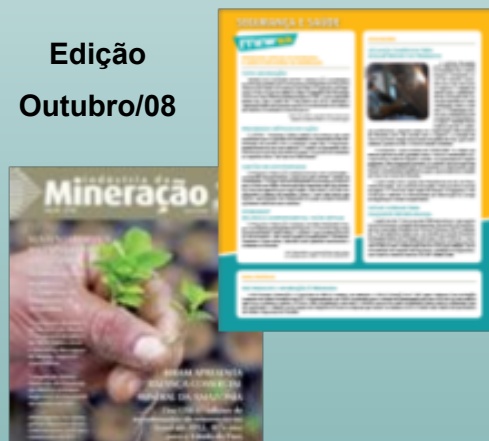
Edição
Nov. e Dez./08



Edição
Jan. e Fev./09



Edição
Outubro/08



Artigo



Edição
Março /2010



V-Data e V-Meeting



Audio-meeting System



Documents in the web System

WHAT WILL BE DONE

- **Medium Term: 2011-2013 - Training : Leaders and Technicians** □ **INVESTMENTS**

Partnership POLI/USP □ **big companies**

POLI – USP – São Paulo University Faculty of Engineering

Partnership SESI □ **small/medium companies**

Homemade solutions □ **in some cases**

- **Contact: Government, Universities, others**

- **Self-assessment** □ **Dec. 2011**

- **Congress “MINER AÇÃO”** □ **Dec. 2012**

- ***GESST – Strategic Group in Occupational Safety & Health***

- **Long Term: > 2015 - External Assessment / production chain integration.**

MINERAÇÃO is GOOD FOR YOUR BUSINESS:

What we want

Greater consistency of risk assessment methodologies

Improve accident rates

Improve relationship: confidence of workers, training, motivation

Improve public IMAGE

Bring GOOD PRACTICES in occupational Health & Safety to the mining companies

Show how important is Occupational Health & Safety theme for the mining industry

COME TO MINERAÇÃO

- **Voluntarily**
- **Companies associated or not to IBRAM**
- **Small and Medium Companies** **low cost**
- **Registration** **commitment**



PROGRAMA ESPECIAL
DE SEGURANÇA E
SAÚDE OCUPACIONAL
DA MINERAÇÃO

THANK YOU

www.anepac.org.br

www.ibram.org.br