IN SEARCH OF EXCELLENCE:

THE USE OF *SIGMA SIX PROCESS* FOR ANALYSE WORK PLACE ACCIDENTS

Walneia Moreira, MD
Coordinator of Occupational Health
Companhia Energética de Minas Gerais, CEMIG®
*- **BRAZIL** -*

What is the "Sigma Six" Process?

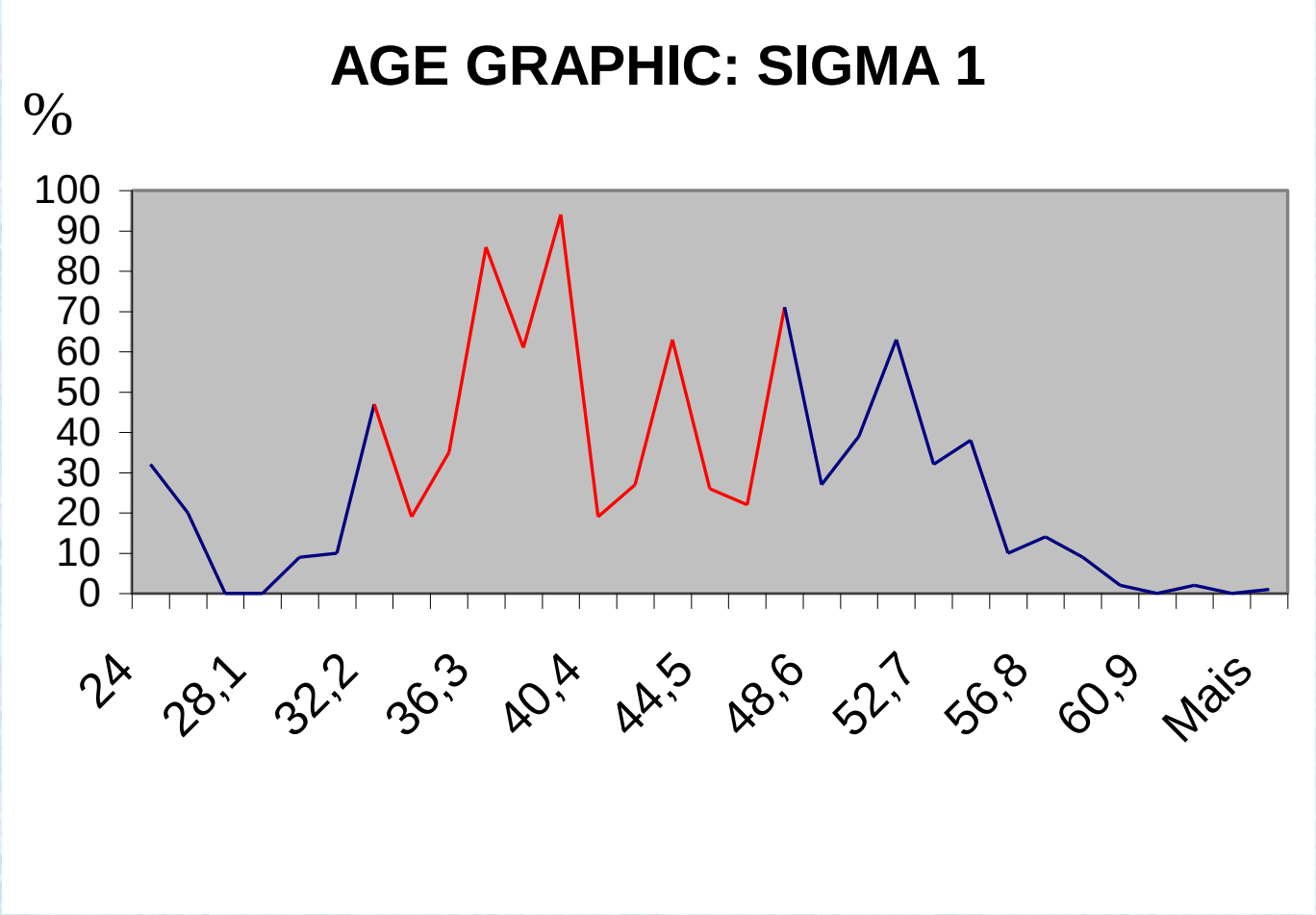
• When analyzing managements "erros" of production, Pareto's Theory can be used, that affirms that 80% of "problems" are due to little causes. It is the relationship called "80:20".

• The last analysis of Sigma Six Process (SSP), bases on the Pareto's Theorem in the following way: Through calculations of Statistics Descriptive, SSP calculates the moda, the medium and the average of the causes of a problem. With these data we can open the Gaussian Curve that accumulates all possible causes inside of 6 standard deviations. The value found exactly in the middle of the six standard deviations (between -3 and +3)is the level Sigma of the problem.

• Considering working accidents, the strategic for its reduction bases exactly on the epidemiology data identified by the level Sigma.

Applying SSP to reduction working accidents

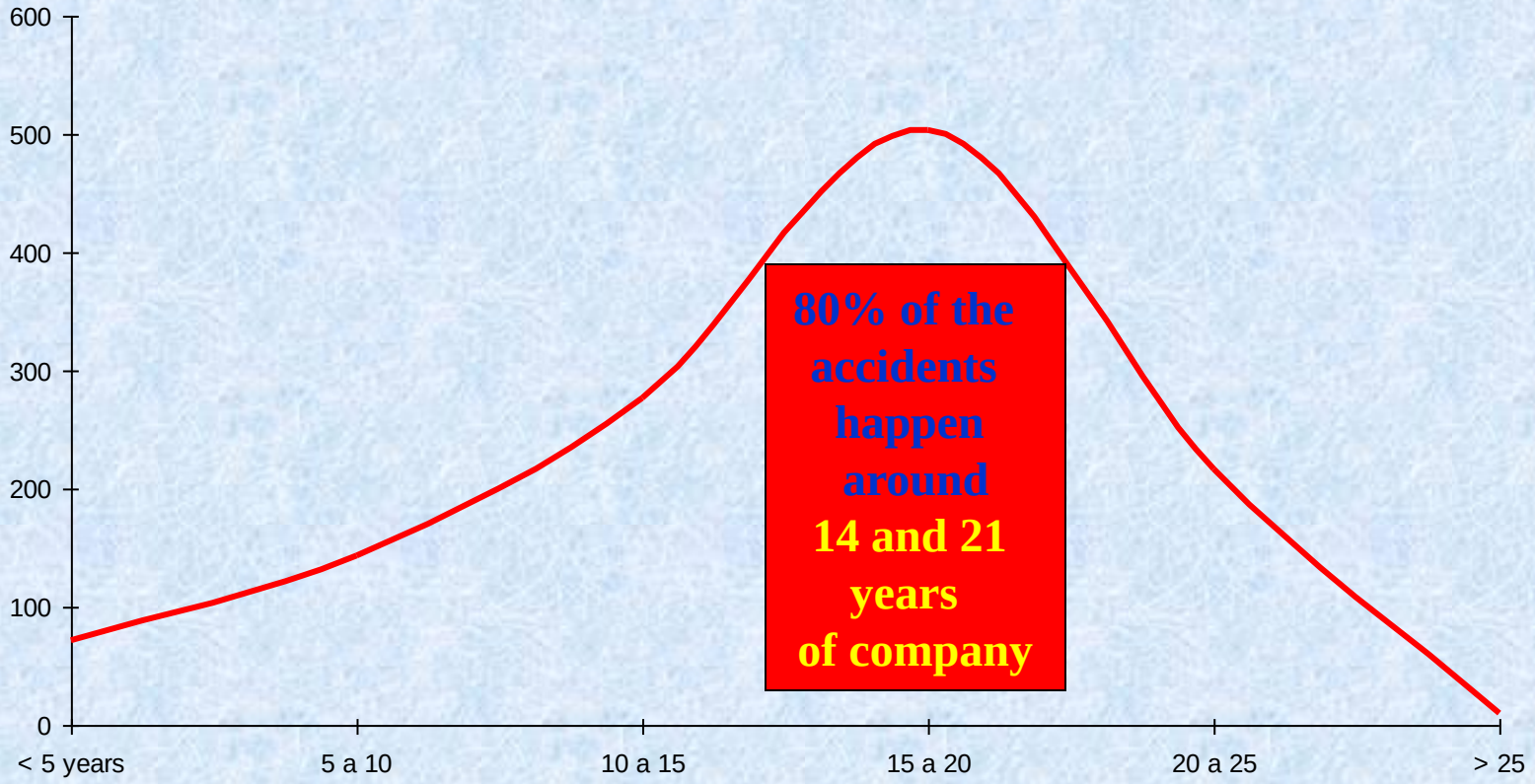
- 1039 workplace accidents happened in the company among 2005-2009
- Data of analysis interest : the employee's age when happened the accident; the time worked in the company; bimonthly of larger prevalence of the accidents; the day of the week when happened a larger number at accidents; the schedule of larger incidence and the causes of fatal accidents.
- We analyzed the data through Statistics Descriptive Methodoly and Sigma Curve was elaborated in graphic presentation for each item of interest of the study.



Dispersion of Sigma 1 age curve: 80% of the accident victims were between 36 and 48 years old with relevance in 40,4.

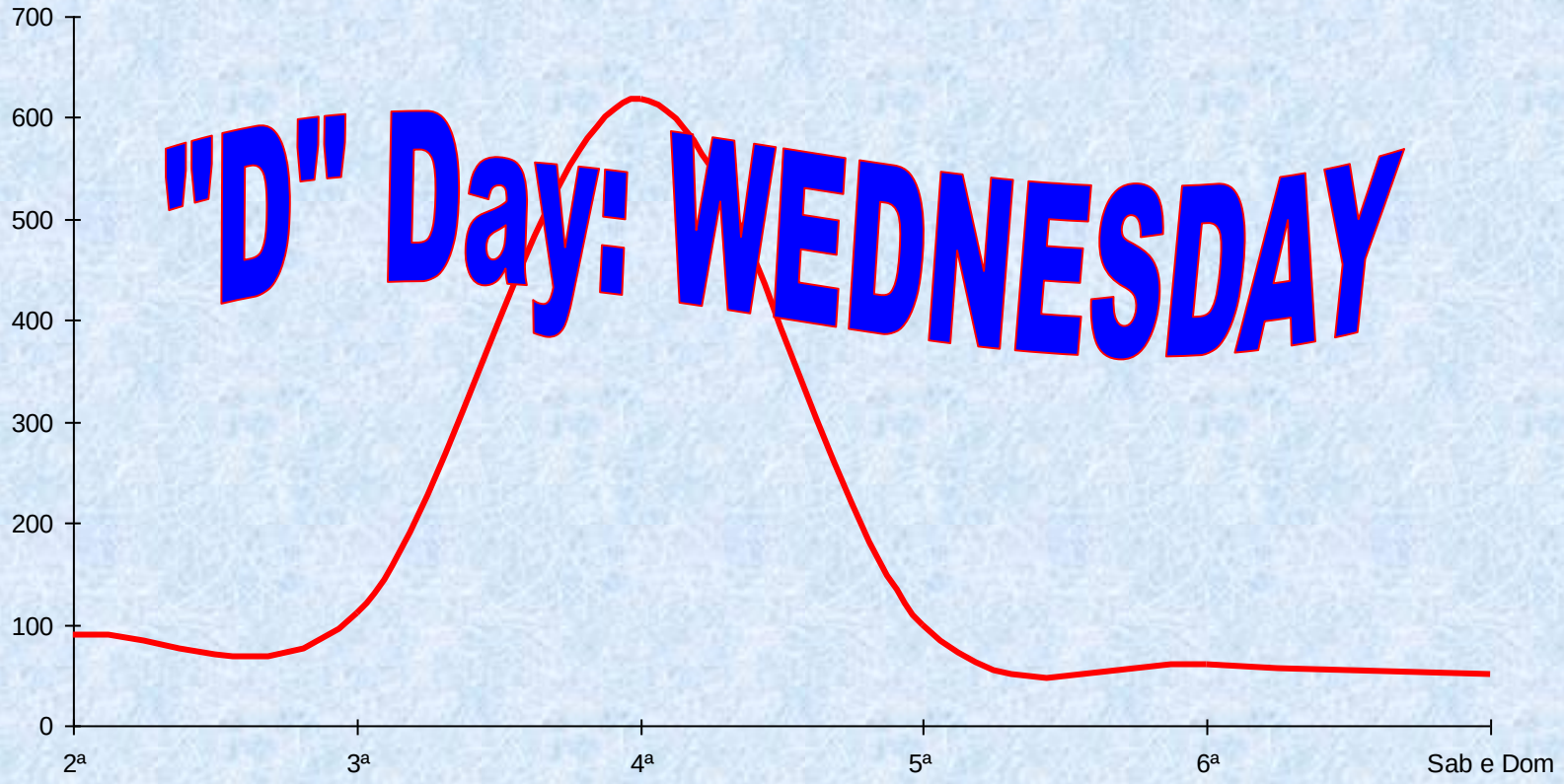
I'm just 40 years old.
I can make everything.
I'm super-man

Worked Time in Company Graphic
(SS 2 Curve)

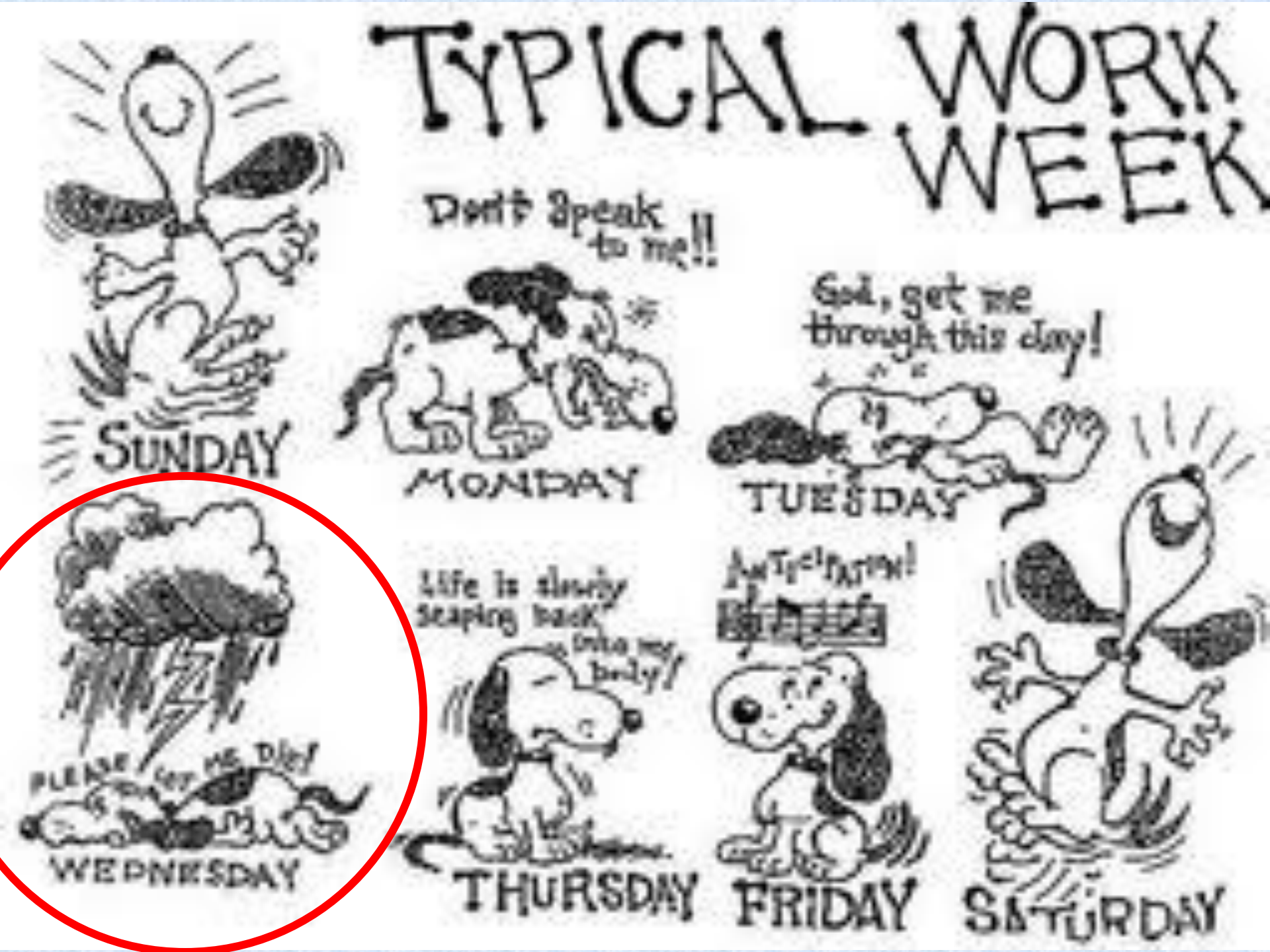


I know what I do.
And I do well,
because I'm
shareholder of
the company.

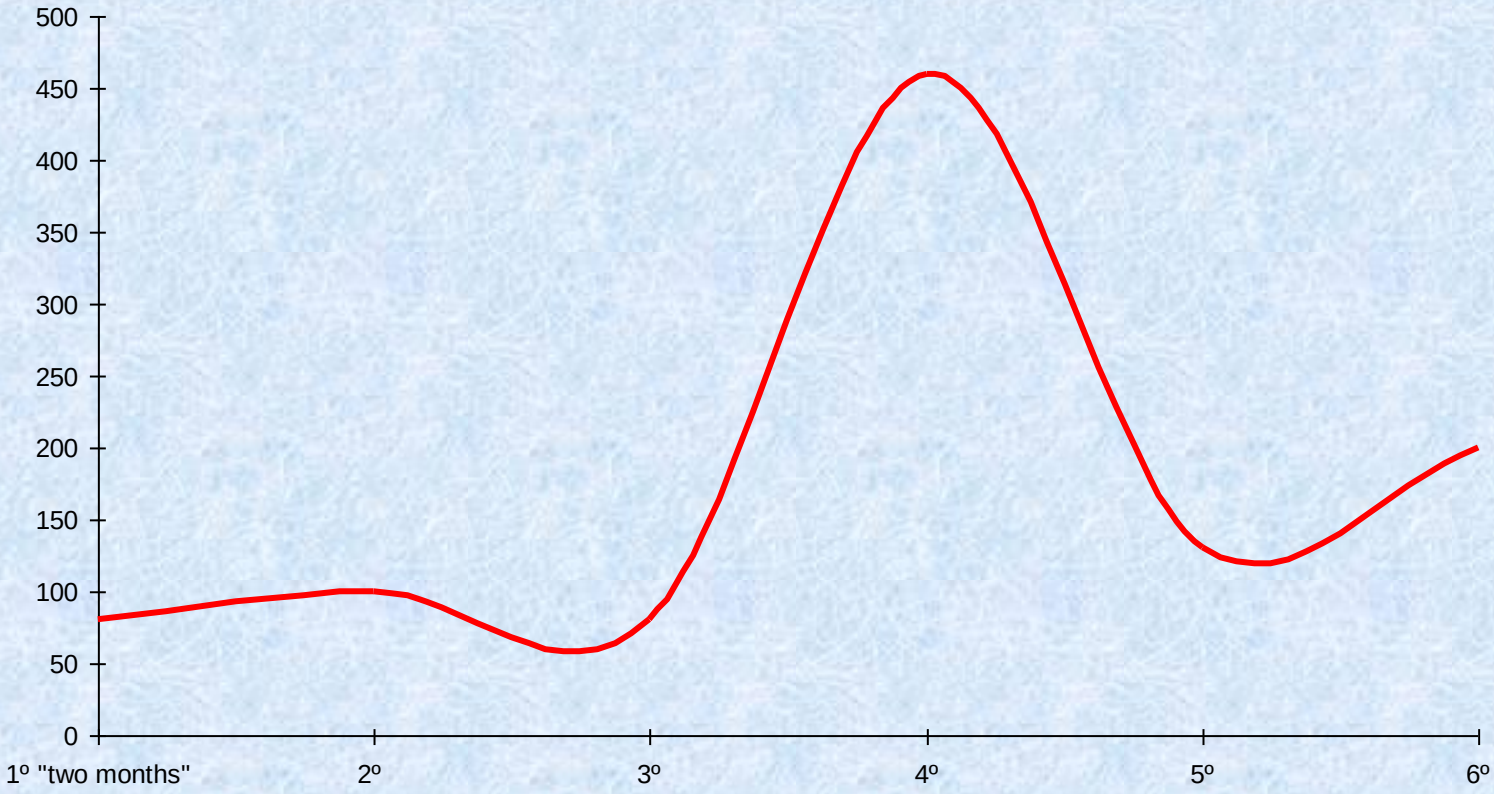
The Week Day Graphic
(SS 3 Curve)



TYPICAL WORK WEEK



TWO MONTHS LARGE PREVALENCE GRAPHIC
(SS 4 Curve)

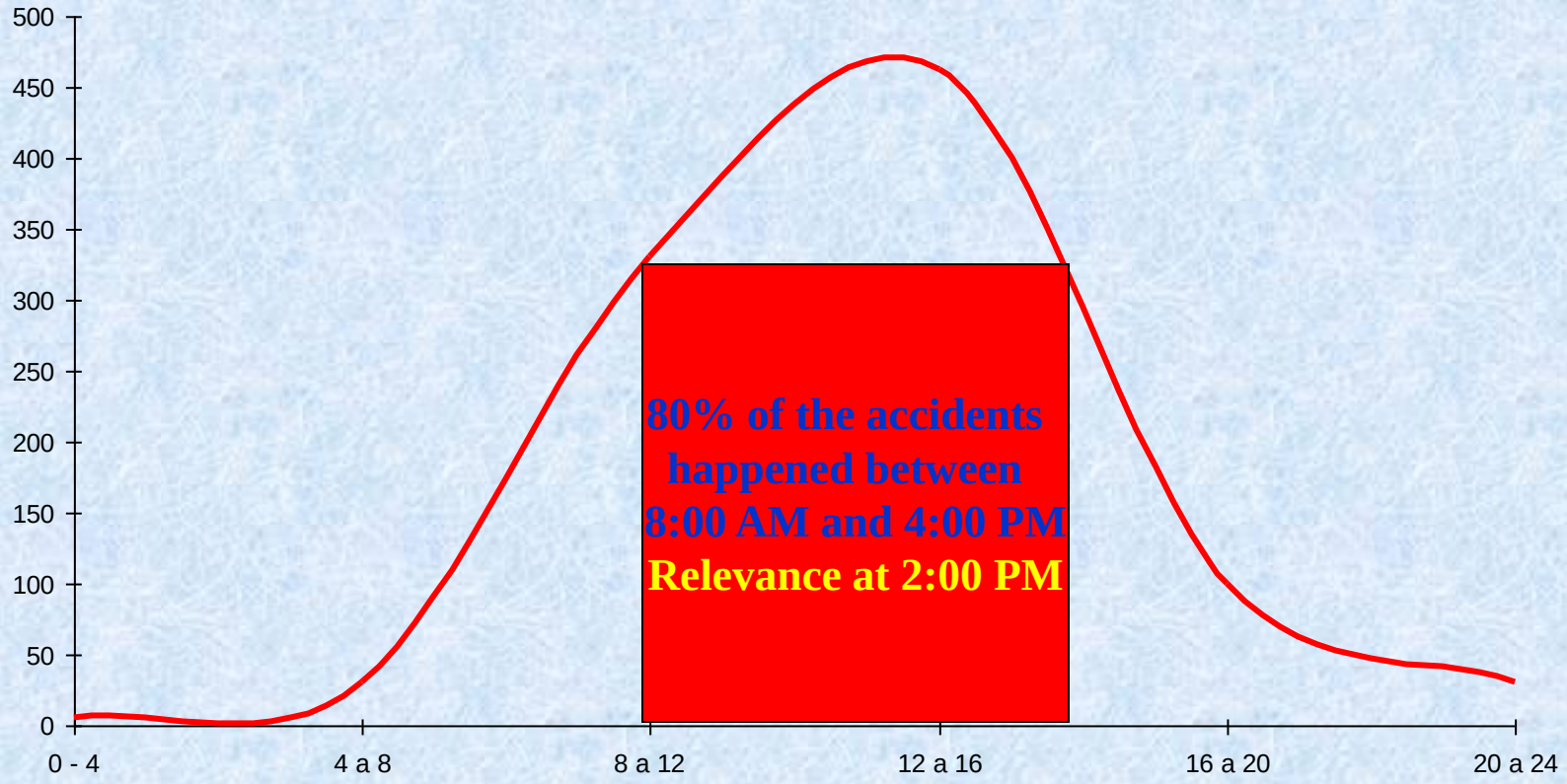


July and August with relevance in August *

*Reminding that the results add all the accidents for two months along 5 years.


AGOSTO

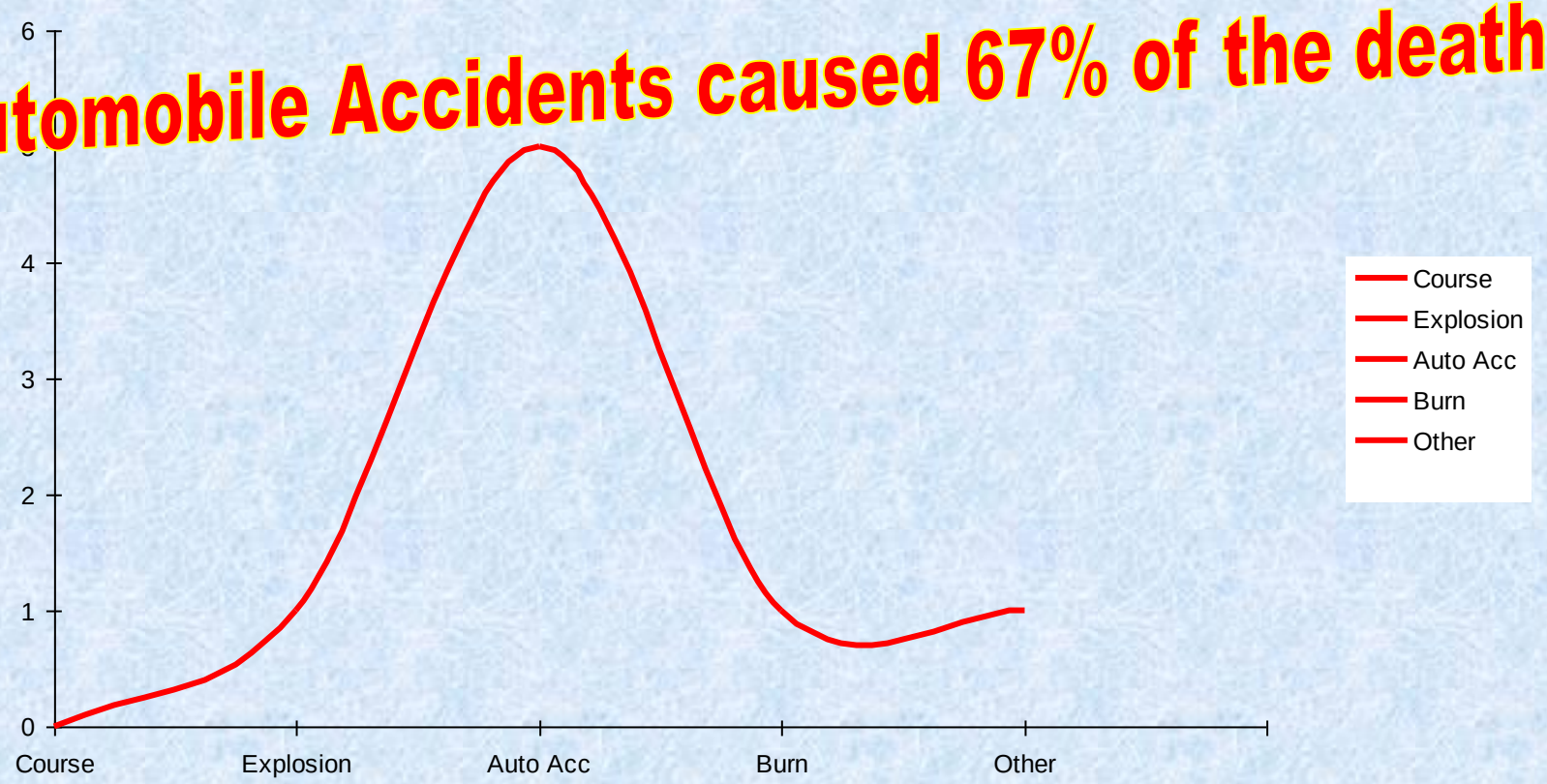
THE SCHEDULE OF LARGE INCIDENCE GRAPHIC
(SS 5 Curve)



La SIESTA: Alkalosis after lunch and the risk of workplace accidents.

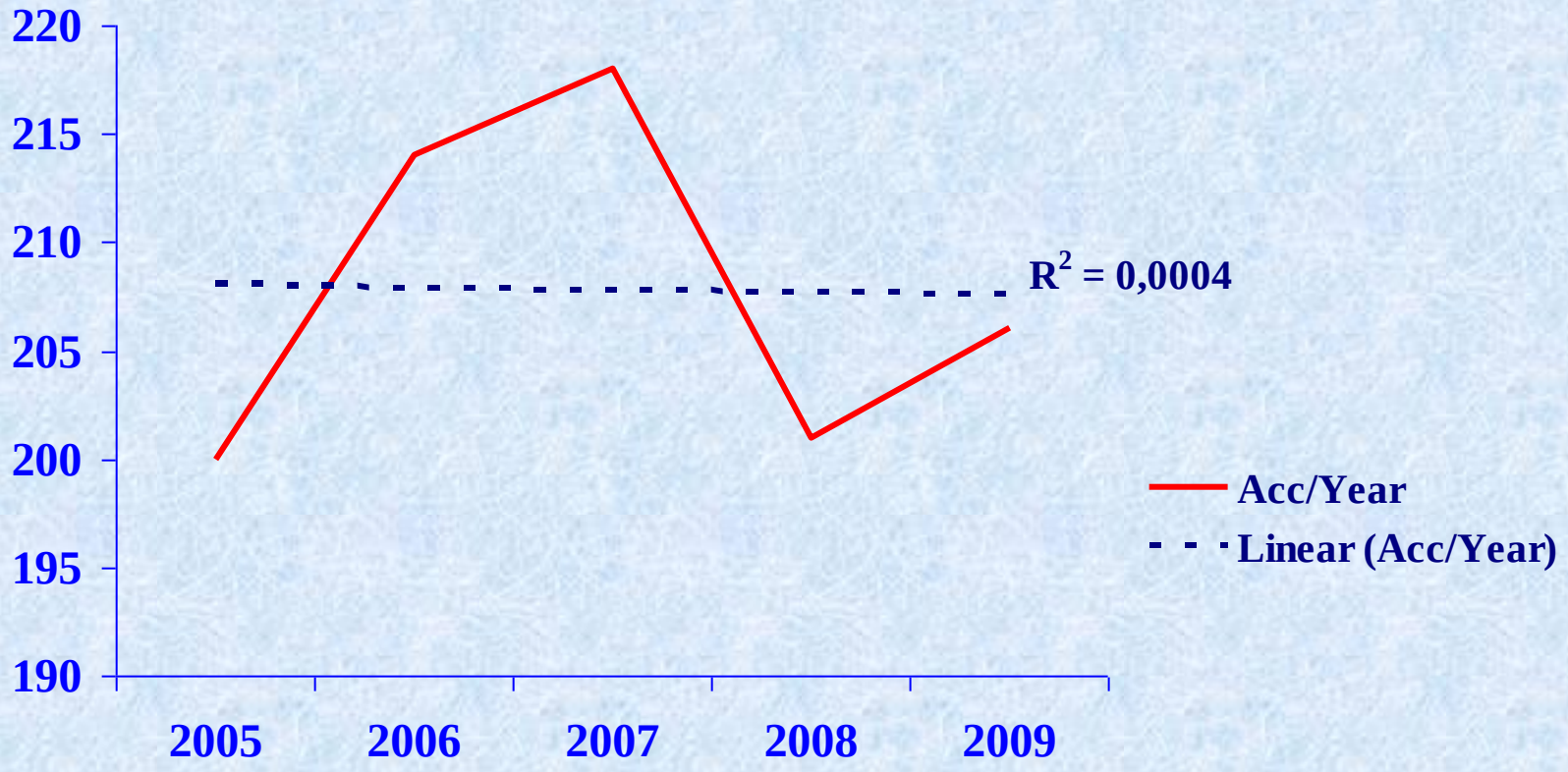
FATAL ACCIDENTS GRAPHIC
(SS 6 Curve)

Automobile Accidents caused 67% of the deaths !



Accident Number per Year Graphic

(plus Pearson Tendency Linear Curve)



RESULTS:

CONSIDERING THAT WORK ACCIDENT IS A MISTAKE OF PRODUCTION, WE CAN USE A TOOL OF INDUSTRIAL ENGINEERING TO DEFINE THE "EPIDEMIOLOGY PATTERN" FOR ACCIDENTS IN THE COMPANY.
THIS STUDY AIMED PERSONAL, ENVIRONMENTAL AND SEASONAL RISK FACTORS AND FOCUS IN SIX SIGNIFICANT VARIABLES.
FROM NOW ONE WE KNOW THOSE 40 YEARS MEN FROM 15-20 YEARS WORKING IN THE COMPANY HAVE MORE RISKS THAN OTHERS, ESPECIALLY AFTER LUNCH, ON WEDNESDAYS, IN WINTER TIME* AND WHEN DRIVING CARS.

The victims' medium age and the time of company can make a safety sensation. But the study data demonstrated to be false. On the contrary, those that think to be safer and experts are the ones that they have larger risk of accidents. When they become aware of the study data they tend to modify behavior.

* *Winter in Brazil begins June, 20 and finishes in September,22*

walneia@cemig.com.br