Improving the Quality at Alunorte Using PI System

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ALUNORTE- Alumina do Norte do Brasil SA

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Our Mission

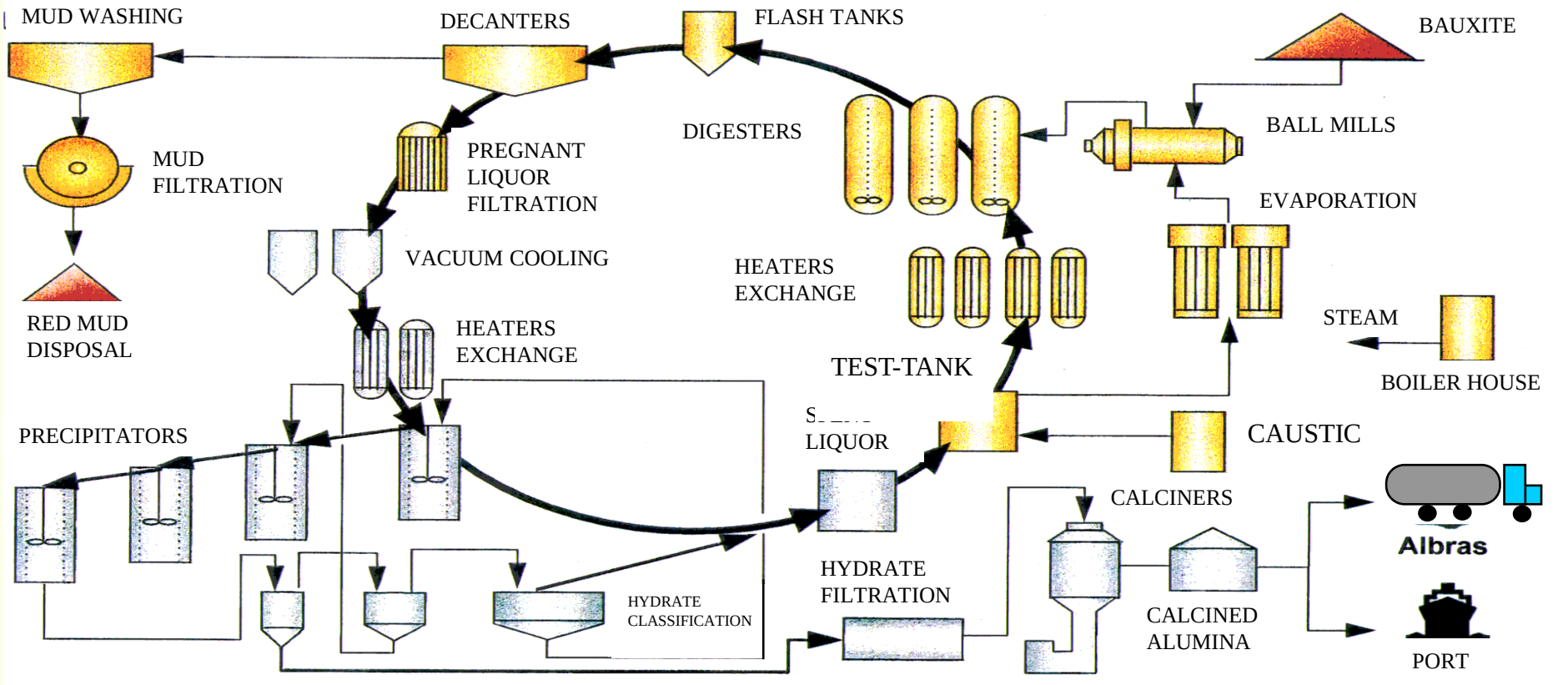
“Supply alumina of superior quality, guaranteeing low operational costs with the best productivity, safety and protection to the environment”.

General Information

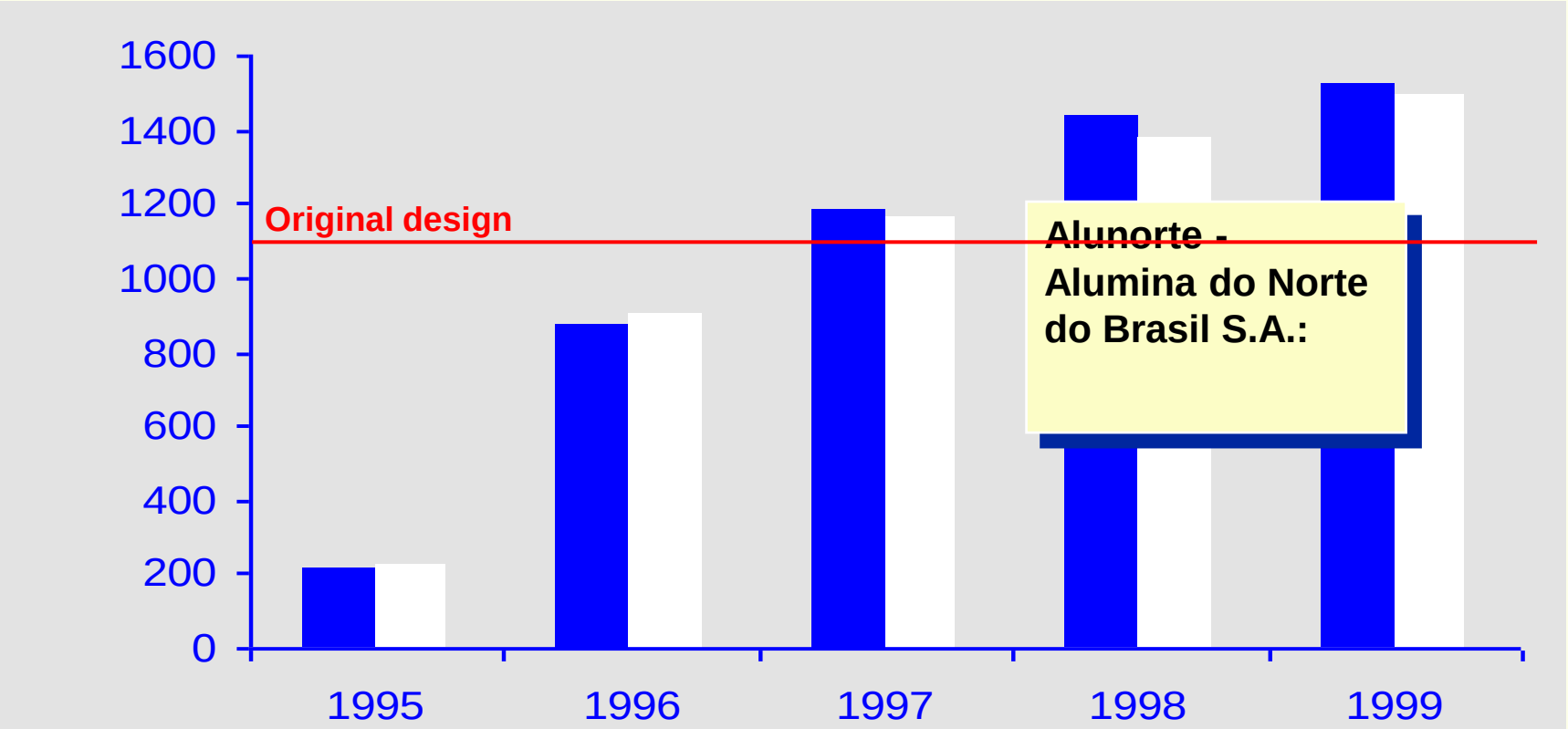
- A company with global investment of U$ 875 millions.
- Start-up in 95, reaching nominal capacity in 97.
- 460 employees.
- 383 contracted workers.

Process Flowsheet

BAYER PROCESS FLOWSHEET



Production data (000 ton)

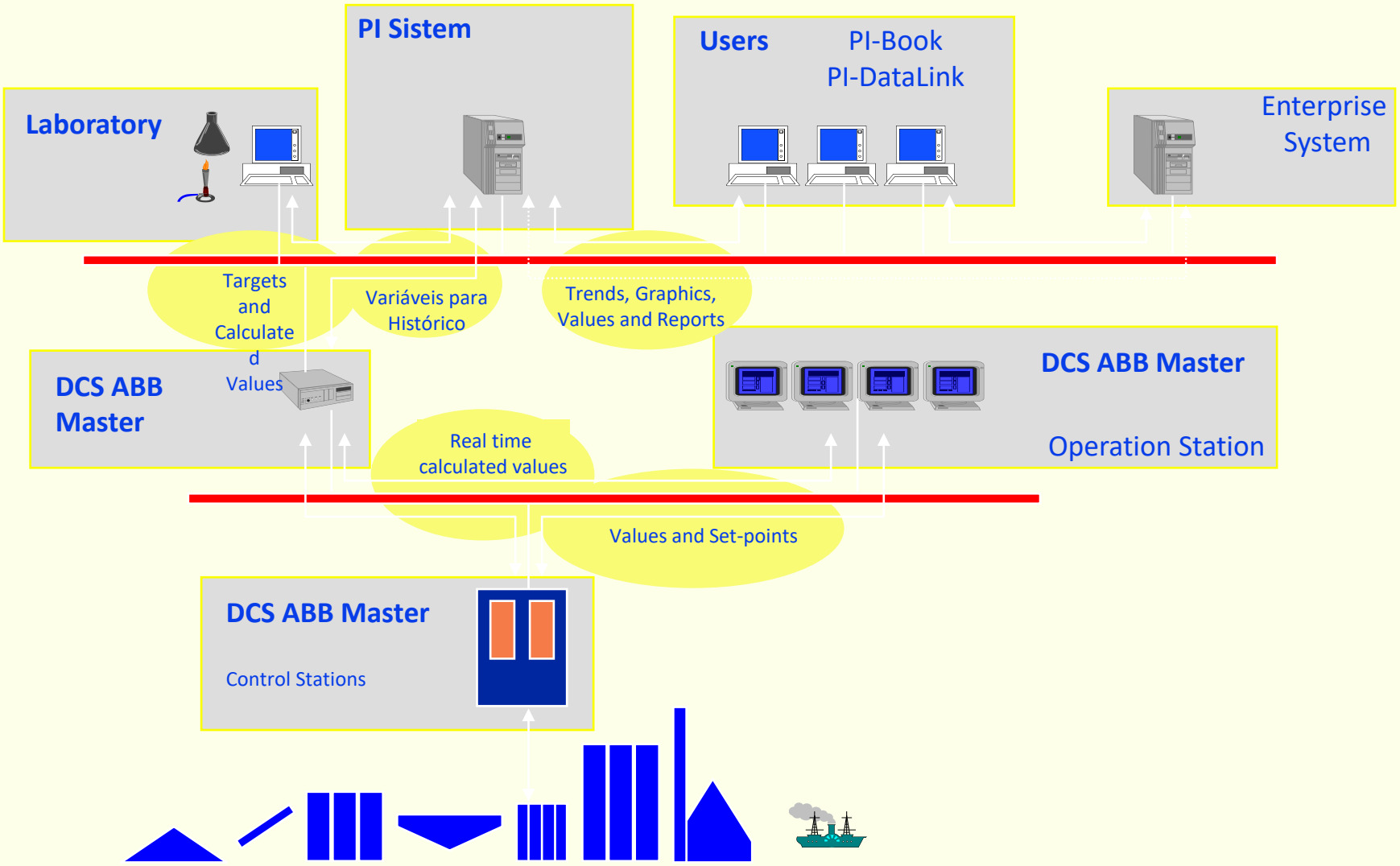


	1995	1996	1997	1998	1999
REAL	215	876	1186	1436	1527
BUDGET	227	904	1160	1373	1495

Alumina Quality Evolution

	ANALYIS	SPECIFICATION (%)		YEAR AVERAGE				
		TIPICAL	MAX	1995	1996	1997	1998	1999
CHEMICAL	Na2O	0,400	0,500	0,36	0,41	0,45	0,37	0,37
	SiO2	0,015	0,025	0,022	0,016	0,015	0,016	0,015
	Fe2O3	0,015	0,025	0,016	0,010	0,008	0,007	0,006
PHYSICAL	LOI (300 - 1100ºC)	0,80	1,00	-	0,76	0,70	0,73	0,73
	- 325 MESH	8,0	10,0	11,4	7,1	3,0	4,0	4,8
	B. E. T. (m^2/g)	70	80	78	73	77	77	76

Alunorte's Network



PI Hardware

- DIGITAL Personal Workstation (500 mhz), running Windows NT 4.0 Server
- 256 Mb RAM Memory
- 3 x 4gb HD
- Raid 5 Controller
- HP-9000, running HP-UX, 10 as interface between PI and DCS

Some Systems Developed Using VBA

- Alumina Storage Monitoring
- Alumina Quality Monitoring
- Continuous Ship Unloader Occurrence
- Itens Control
- Plant Occurrences

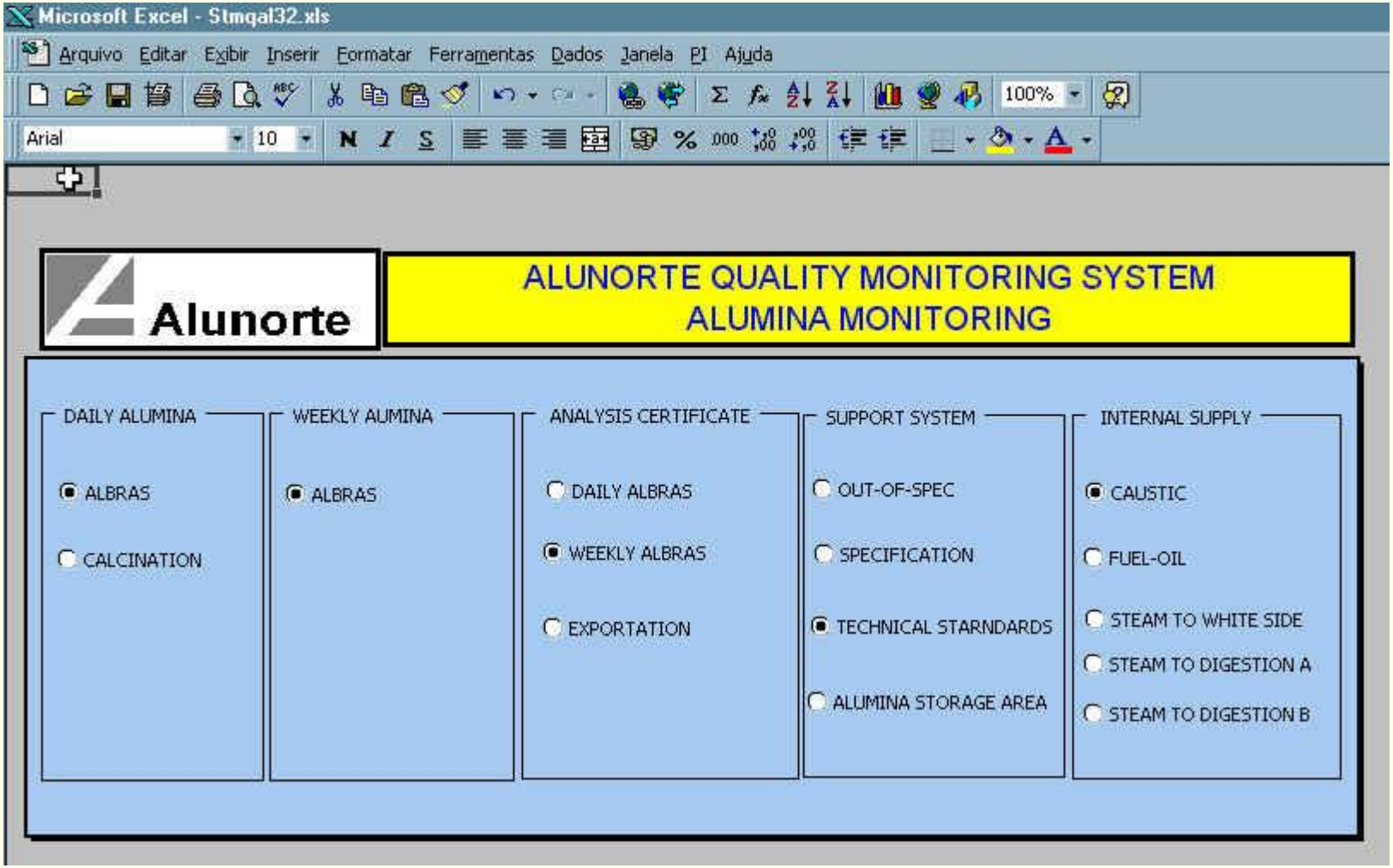
What Means PI Culture ?

- PI-Book is the only data link among plant floor and managers, including Director;
- Intensive PI-Datalink use to find out the answers to Process and Maintenance problems
- PI-Book consolidation as the unique tool to access all Windows based System
- Intensive use of calculated tags in order to automate data generation

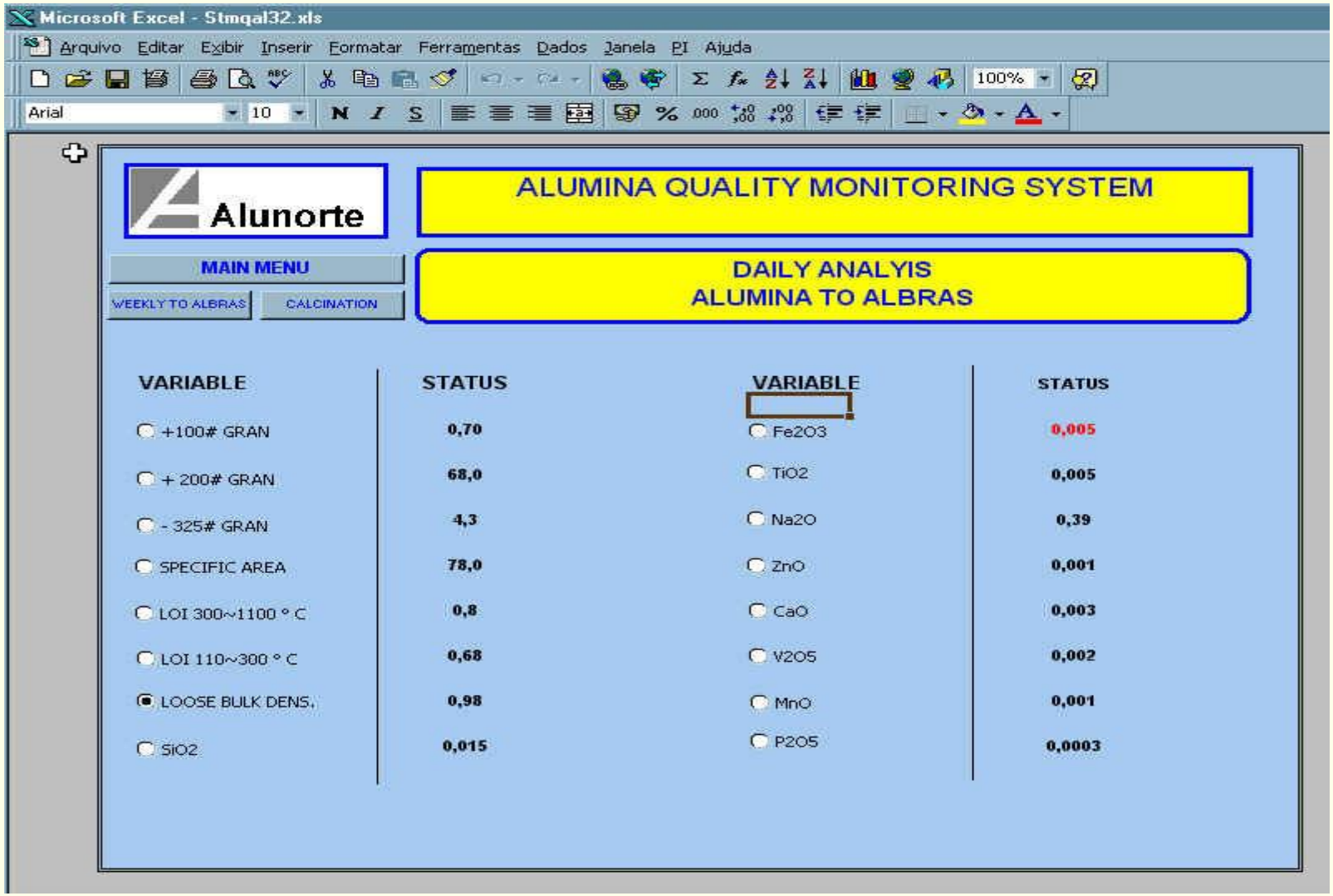
Alumina Quality Monitoring System

- Allows continuos alumina quality monitoring, in real time, in order to detect process deviations and pro-active actuation by process people
- Was used as support system to ISO 9.0002 Certification
- Totally developed by Alunorte's people
- Has been used by operational and process people as a routinely tool to track quality deviations
- Was developed using a Drilling-down technique, in order to permit the scanning since the quality variables up to process variables in a sorted way and increasing the changes to find out the main reason to quality deviation in shorter time

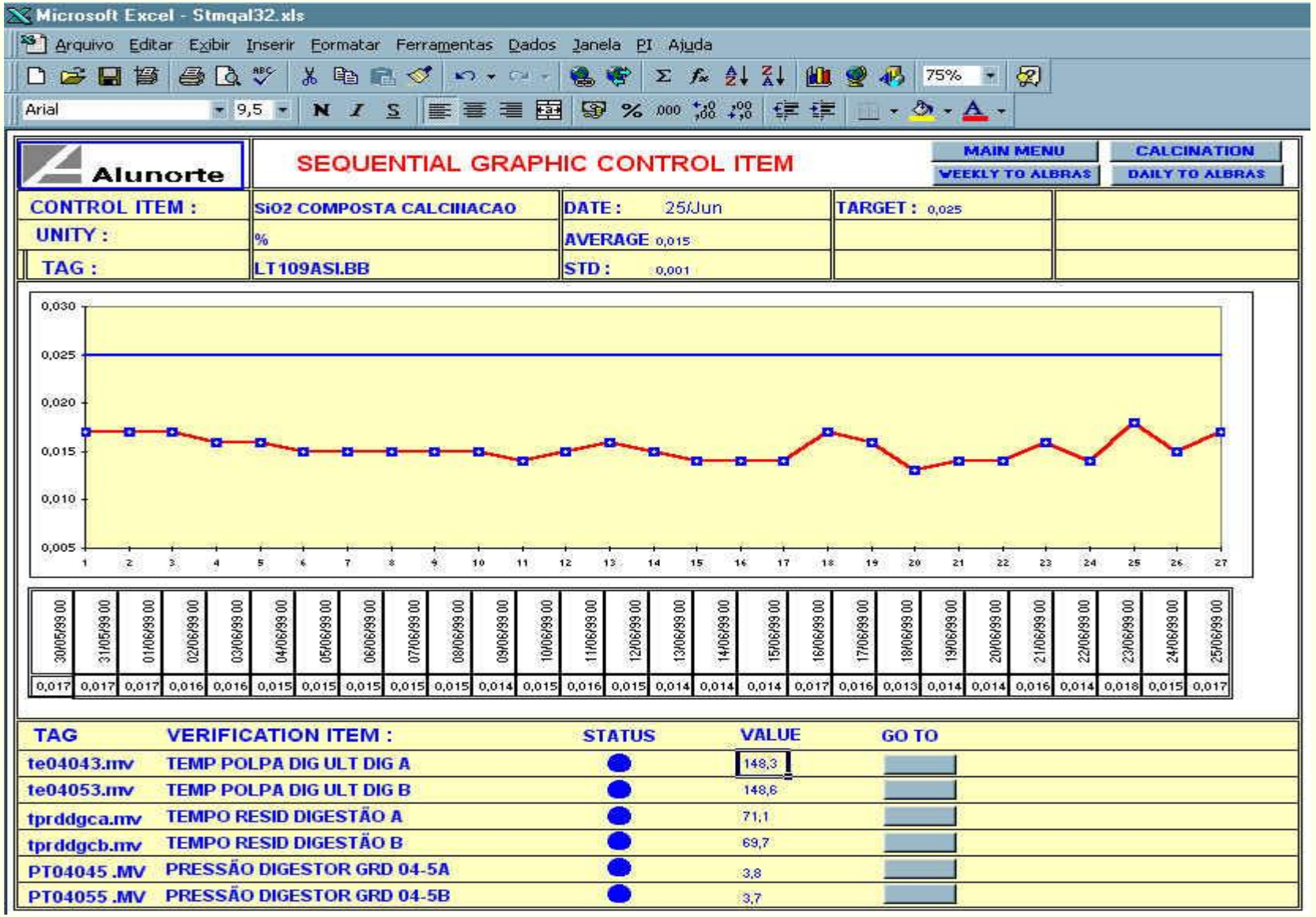
Alumina Quality Monitoring System Main Screen



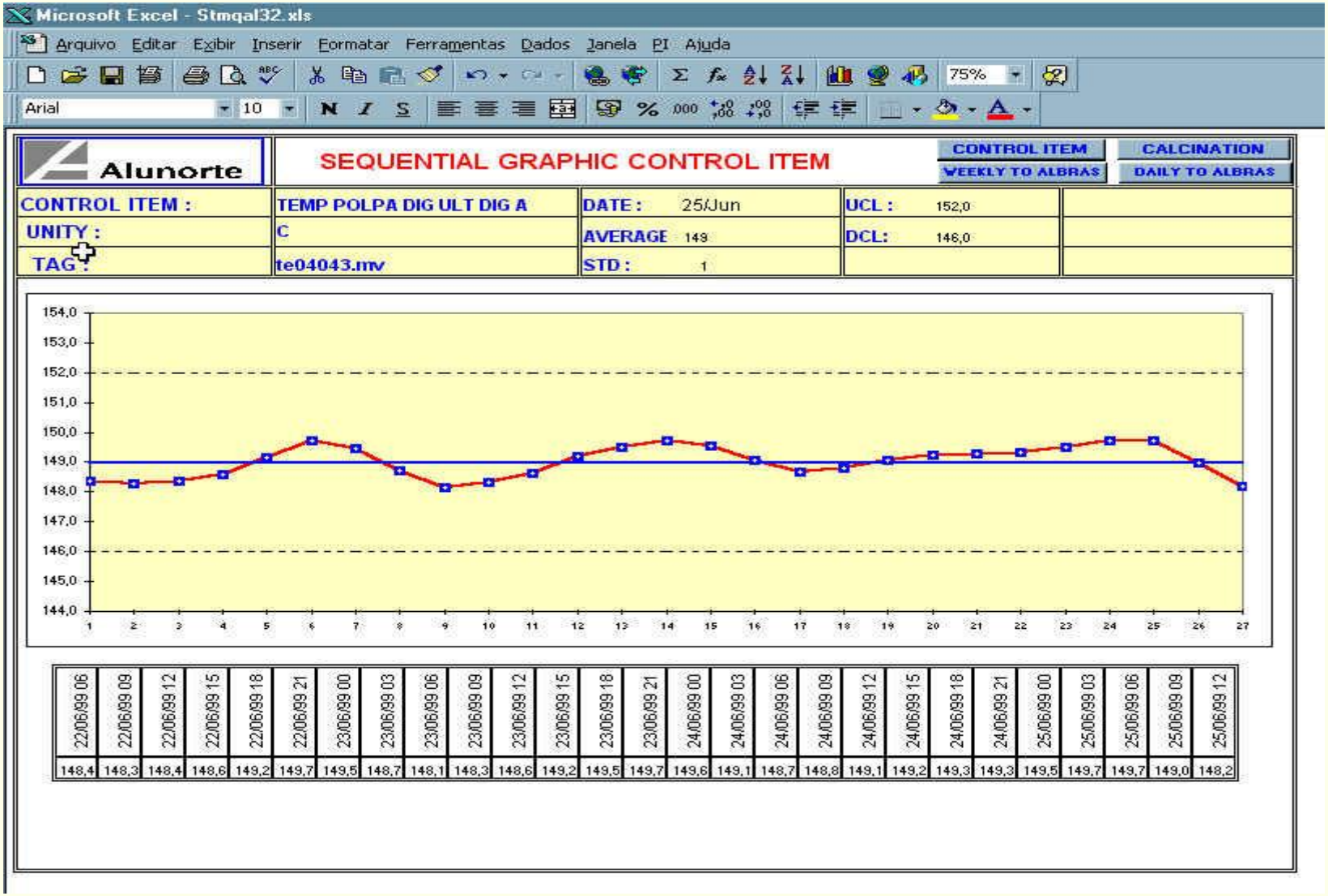
If a red number appears, then you have a quality problem, and you must click in to start the process scanning



The process scanning in progress



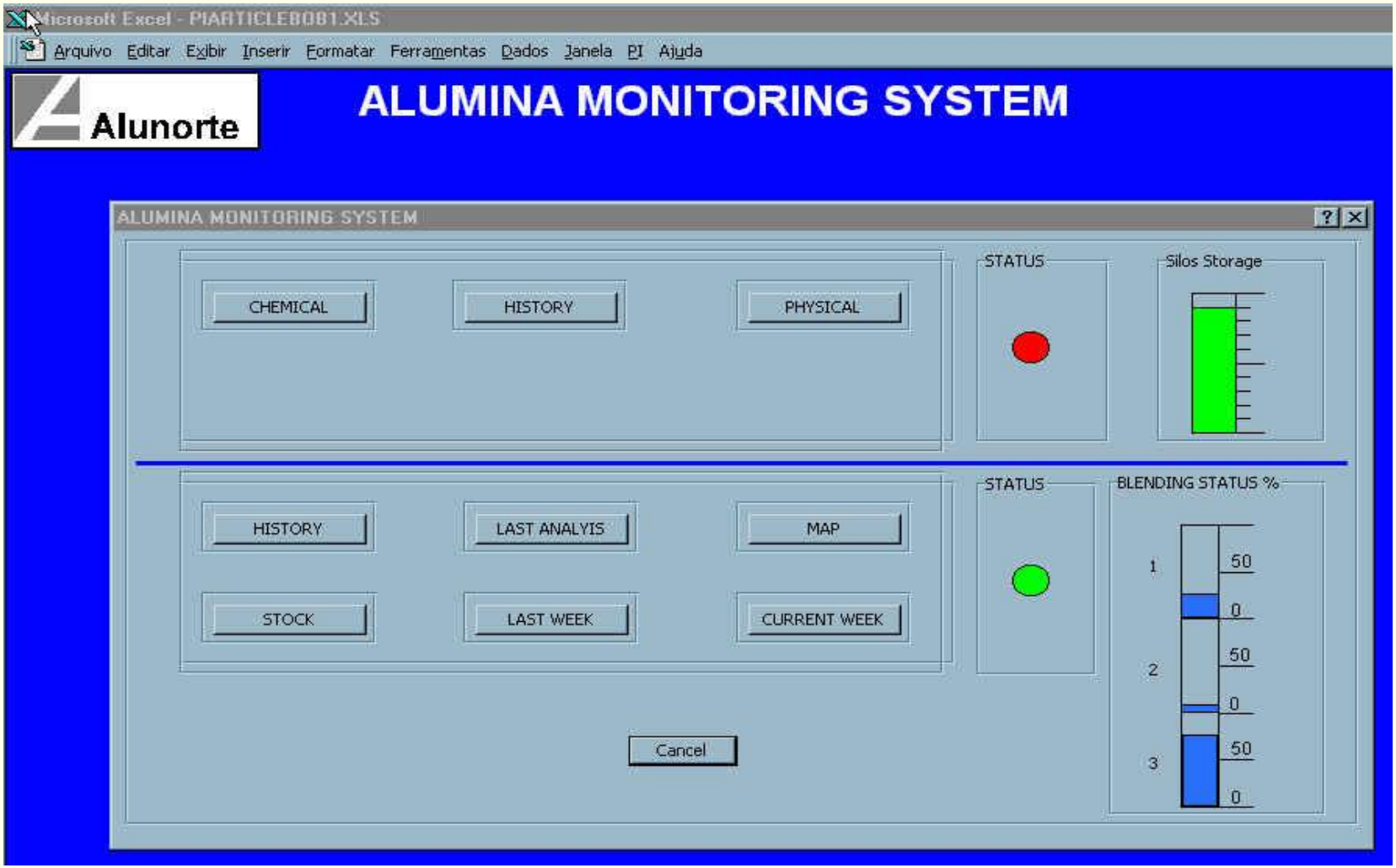
The final level of the process scanning (fundamental variables graphics)



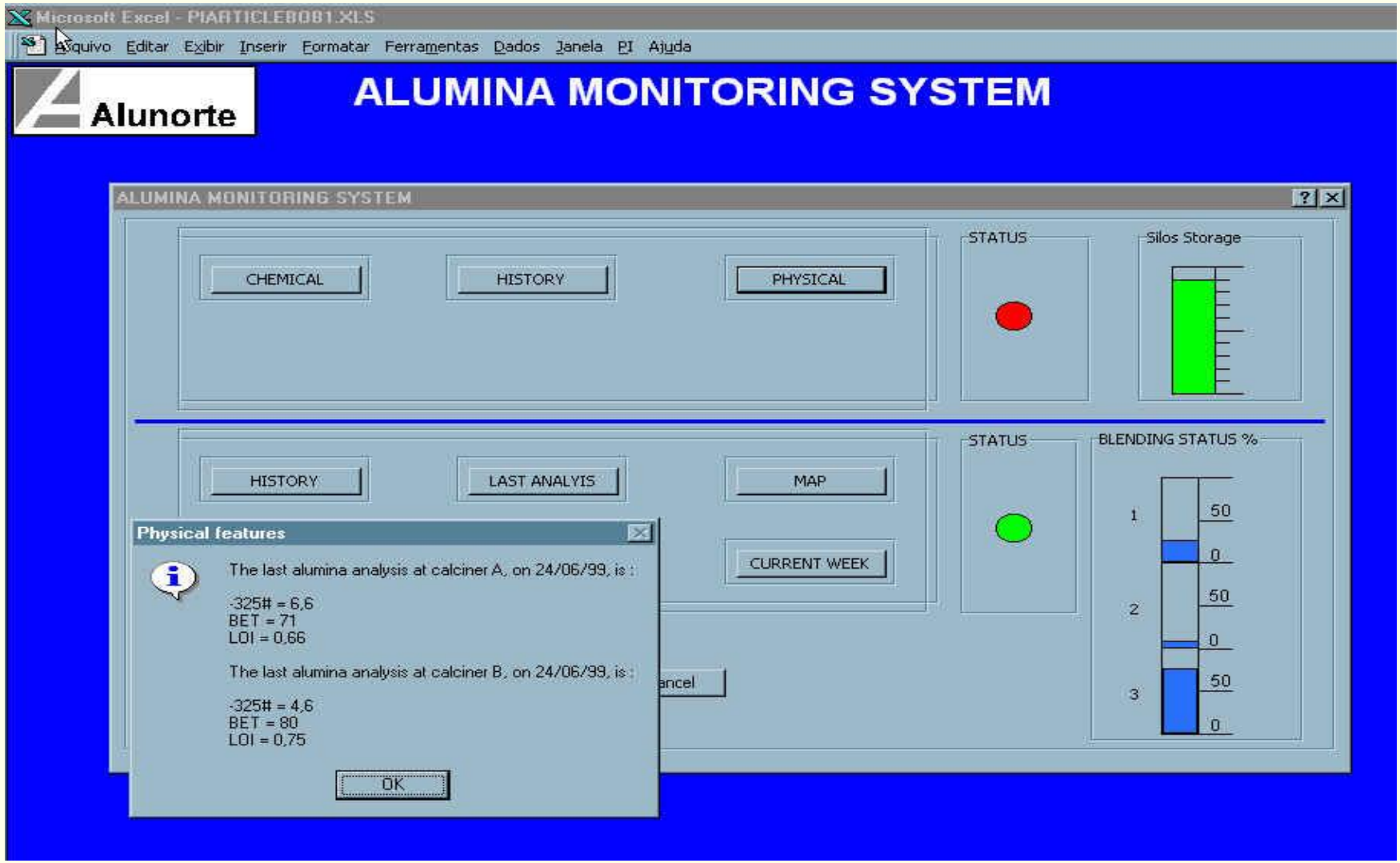
Alumina Storage Monitoring System

- Allows continuos alumina storage monitoring, in real time, in order to detect quality deviations, due to storage process, in advance and allow pro-active actuation by operational people
- Was used as support system to ISO 9.0002 Certification
- Totally developed by Alunorte's people
- Has been used mainly by operational people as a routinely tool to track alumina storage conditions

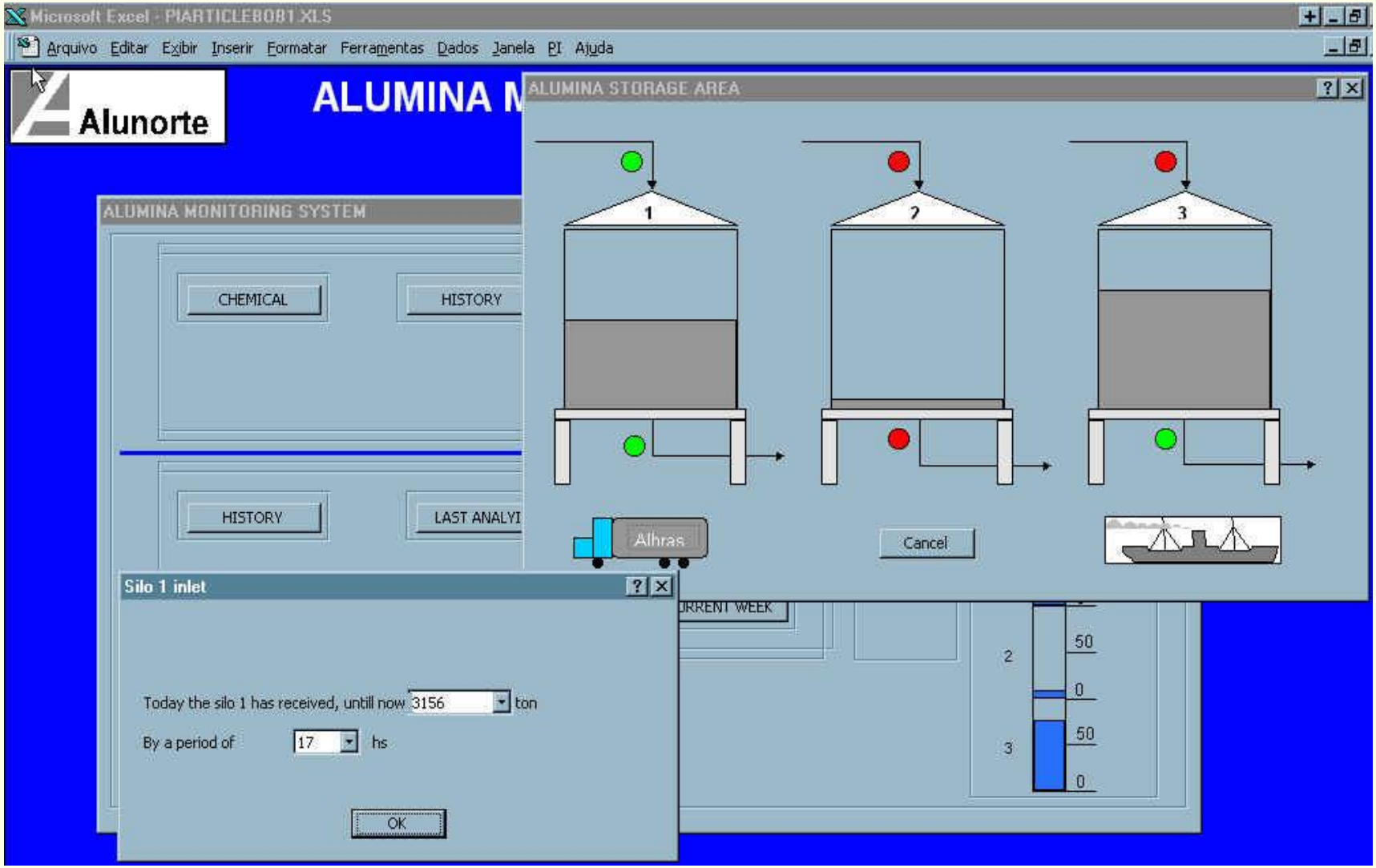
Alumina Storage Monitoring System Main Screen



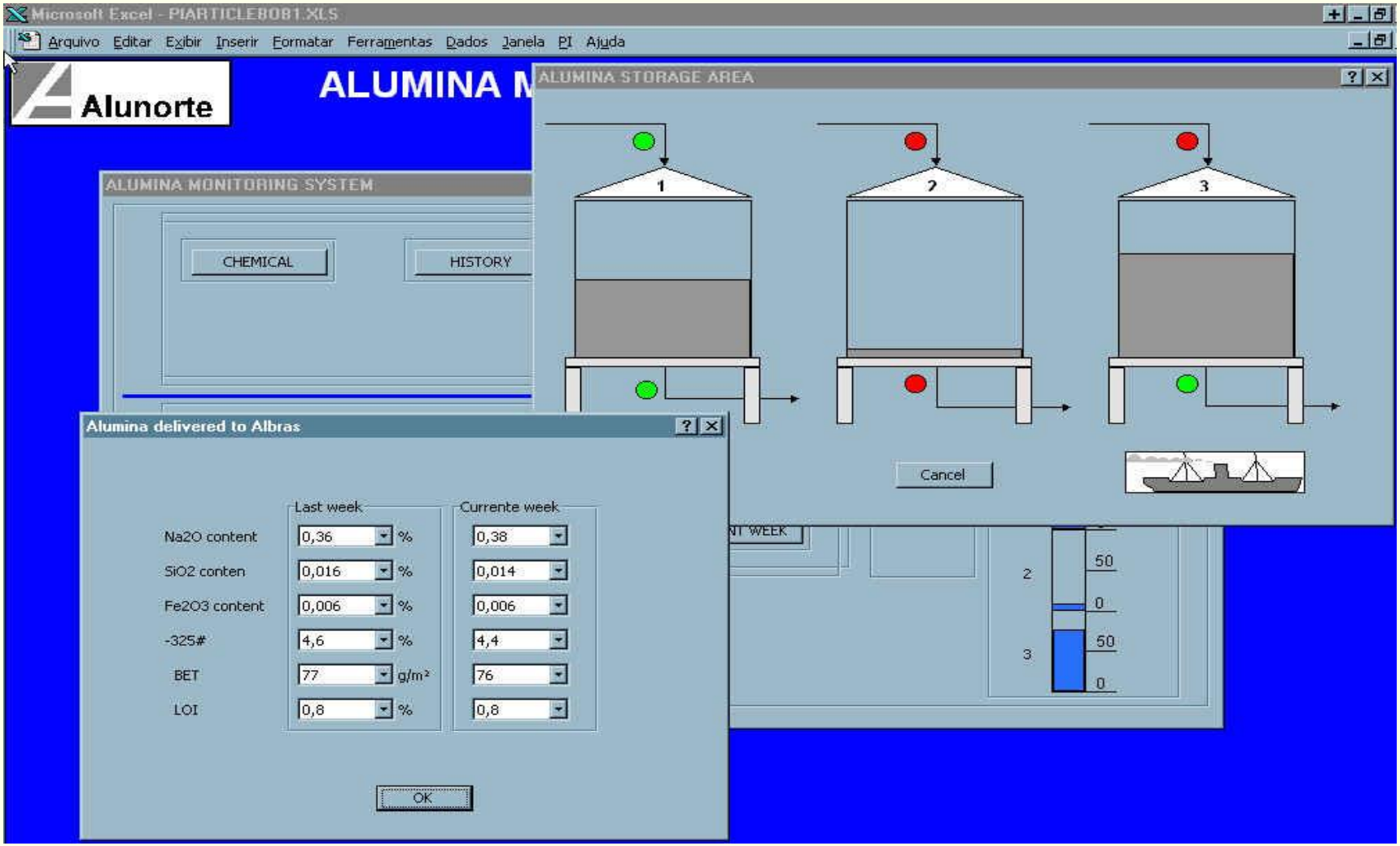
Checking out the alumina quality at silos entrance



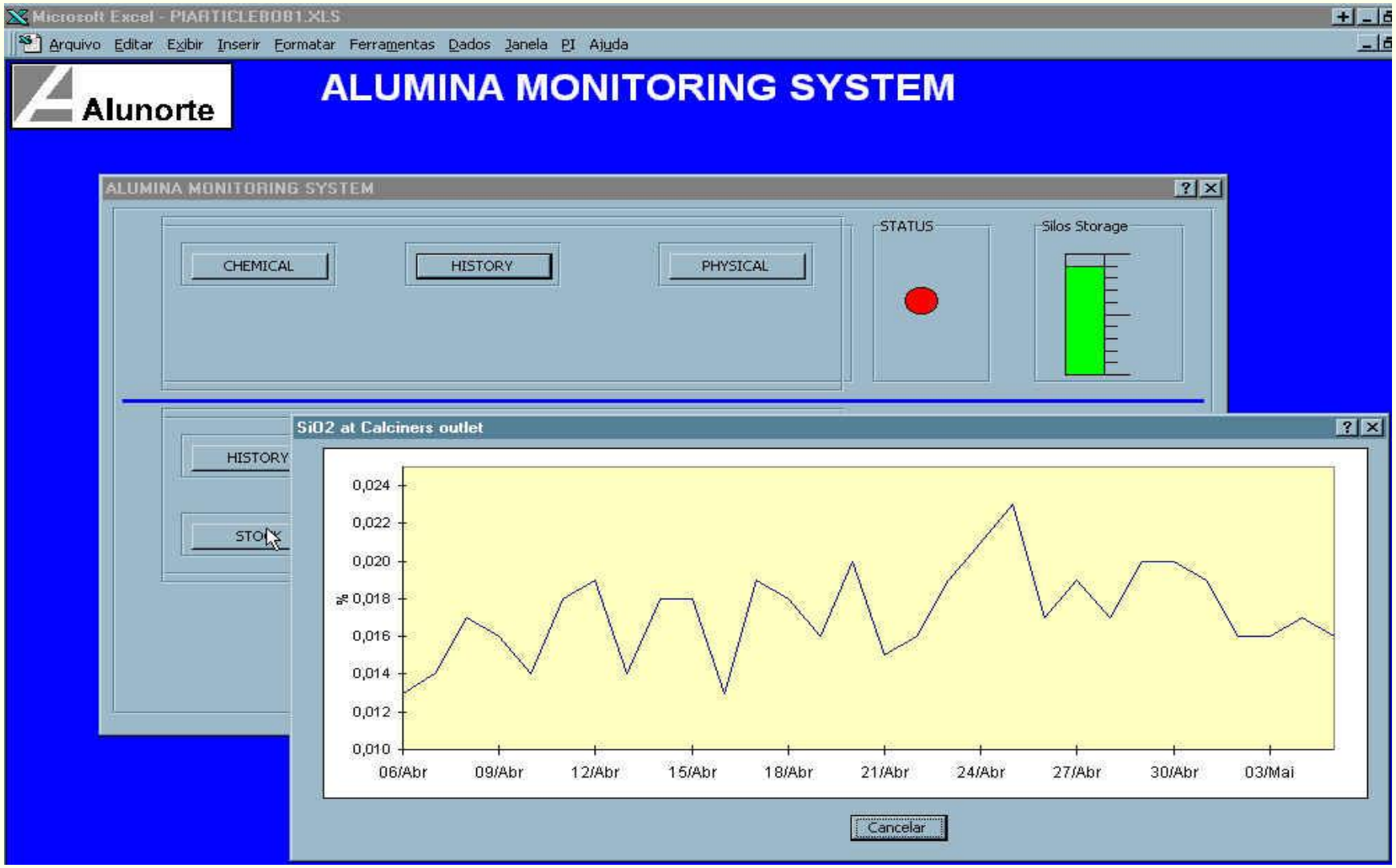
Checking out the total alumina received by silos in the day



Checking out the delivered alumina quality



Checking out the alumina quality trend



Getting an warning due alumina quality problems at silos entrance