VISION
AS 2500 HS PF

CILACAP-INDONESIA

PERTAMINA REFINERY

PERMANENT EXPLOSION PROOF HOIST

SAFI GROUP

Our Company

With more than fifty years of experience, SAFI GROUP is a world leader in the **rack & pinion elevation sector.**

Alongside a **vast portfolio** of standard products and models, which covers everything from **mast climber working platforms (MCWP)**, to **material hoists (MC/PC)** and **construction elevators (AS)**,

SAFI GROUP features a **dedicated engineering division exclusively reserved for studying, designing and eventually realising customised products based on each and every client's demands.**

These can vary from **permanent lifts** for **industrial sites**, to **ATEX machineries for chemical plants**, specially made **working platforms** (or even variations to existing standard products) for particular structures and **heavy duty lifting equipment for shipyards**.

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PERSONNEL & MATERIAL HOIST VISION AS HS

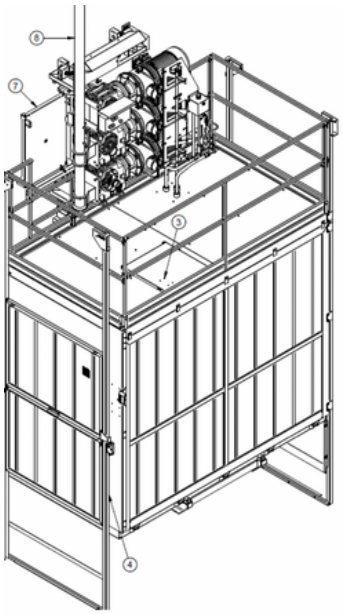
AS stands for close cabin elevator for **Personnel & Materials use.**

The **Vision As Hs** hoist offers different **Load capacities:**

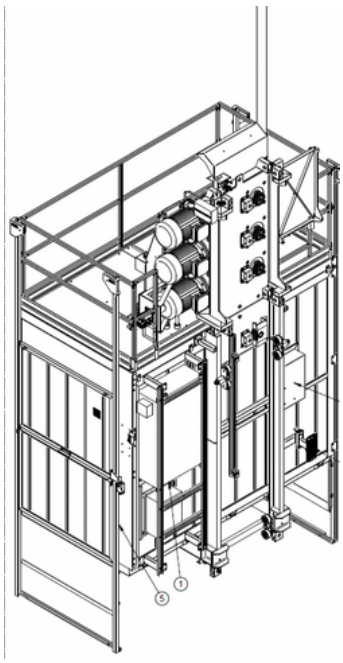
1500 / 2000 / 2500 / 3000 / 3500kg

depending on the client's needs.

The hoist has **standard dimensions of 3.00 x 1.50 meter and the height of 2.30** meter.
Its dimensions make it a good solution for a **Solid & strong** access system with huge capacity which can be installed both in the industrial & construction sectors.



The elevator has a solid structure in the design and future components which can be **manufactured according to client needs & specifications**. The lift has a design which meets **all CE safety requirements for working in safety**.



The **rack and pinion system** in such machines gives the possibility to reach the maximum height of 250 meters, with higher elevations possible, yet to be verified depending on each application.

The **elevator** can be installed using different **mast sections shapes, depending on the installation site (each with its own carachteristics** and it is controlled by **electric motors made in Germany** with a standard speed of 34 m/m till 90 m/m & can be operated in different climate (from – 40 till +55).

Different door designs (both for cabin and landing floors) are available and fully integrated with the lift, and can be chosen according to client's requests.

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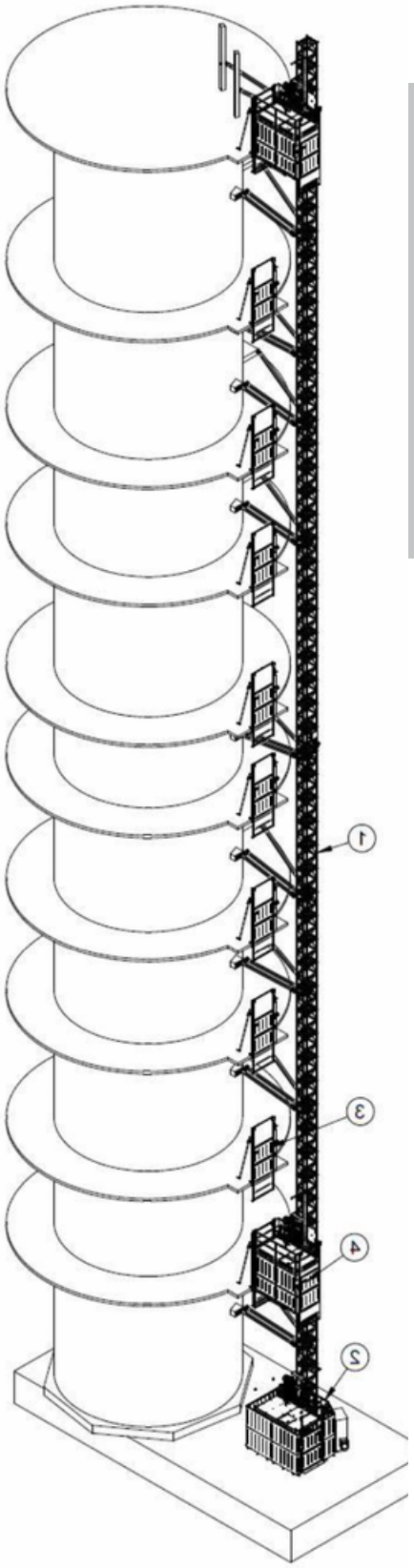
THE PROJECT OF PERTAMINA REFINERY

The project in hand consisted in the **replacement of the original ATEX lift** installed beside the silo, which had been considered unstable and at its end of life.

No plant shut-down was to be programmed to allow the old lift removal and the installation of the new unit, therefore a complete retrofit had to be implemented in the design of the lift, to make sure no modifications to the silo and base structure were necessary.



TECHNICAL CHALLENGES OF THE PROJECT

The no-shut-down condition posed some **technical challenges**, first and foremost the implementation of an adjustable tie-in system to perfectly fit the original tie-in fixing points on the client's structure, which happened to be at a considerable distance from the column itself.

Furthermore, the need of installing a safe **electrical panel** in the cabin to house the main brain of the lift, required a **continuous safe air supply**.

To overcome this, **a specific 3 way cable / hose trolley** was designed and realised, which connected the 2 main pressurised panels (ground + cabin) **ensuring safe and reliable operation of the lift.**

This solution ensured a much higher maximum reach to the lift compared to other solutions commonly available on the market.

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NEWLY DESIGNED SAFETY FEATURES

In accordance with the client request for a speedy and safe **evacuation** of the plant in **case of an emergency which let the lift without electrical power**, a **failsafe manual descent** device was implemented in the design of the lift. This system, activated by a series of safety operation from inside the cabin, can lower the lift at a controlled speed in case of no power, **eliminating the risk of getting stuck between floors due to parachute brake intervention.**

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TECHNICAL DETAILS

1. CONTROL PANEL

The particular installation environment of the elevator required the use of all explosion-proof panels (which contain the explosion in case of an ignition) or micro-pressurized panels (a micro-pressurization of the panel allows to keep the explosive atmosphere out of areas with power components);

1

2. PLC AND TOUCHSCREEN PANEL

A PLC is used for general machine management and integration within the refinery system to report operating status and alarms.
Shared data and a series of machine movement commands are also reported on an ATEX touch-screen panel located on the cabin panel.

2

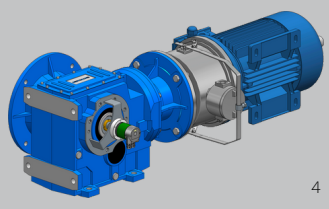
3. EMERGENCY INTERCOM

The hoist has a pair of intercoms with an UPS (uninterruptible power supply) for emergency situations in order to connect the inside of the cabin with the base enclosures.
Electrical connections have also been provided for a possible third unit to be installed in the control room.

3

4. ATEX Gearmotors:

Combine gearmotors with ATEX motor and brake



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5. ATEX ENCODER FOR PRECISE LANDING STOPS

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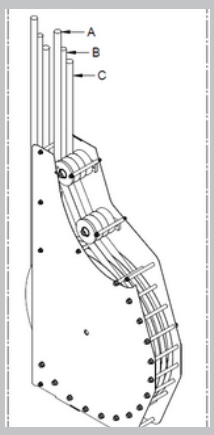
6. ATEX DOOR LOCKS:
Speed-controlled emergency manual descent.

The hoist is also equipped with an auxiliary hydraulic system. In case of emergency without power supply it will be possible to bring down the cabin at a controlled speed lower than the parachute brake engagement speed. The safety of the operator is therefore increased since there is no danger of being trapped inside the cabin with the parachute brake engaged and without any possibility of device reset.

7. POWER SUPPLY VIA 3-CHANNEL CABLE TROLLEY

The peculiarities of the atmosphere in which the lift is located require the use of explosion-proof panels (which contain any possible ignition inside them) and micro-pressurised panels.
A special 3-channel trolley able to manage :
A- motors power cable (downstream inverter)
B- Pressurized air hose;
C- Elevator control cable.
has been designed and realized to allow the correct connection between the ground panel and the cabin panel.



8. CUSTOMIZED ADJUSTABLE TIE-INS

As the basic hoist was a retrofit, the position of the tie-ins on the customer's structure was defined as a fixed point since the beginning.
In the absence of precise drawings and measurements due to the limited documentation on the structure sent by the customer, they were designed and manufactured to allow a certain adjustment range during installation.

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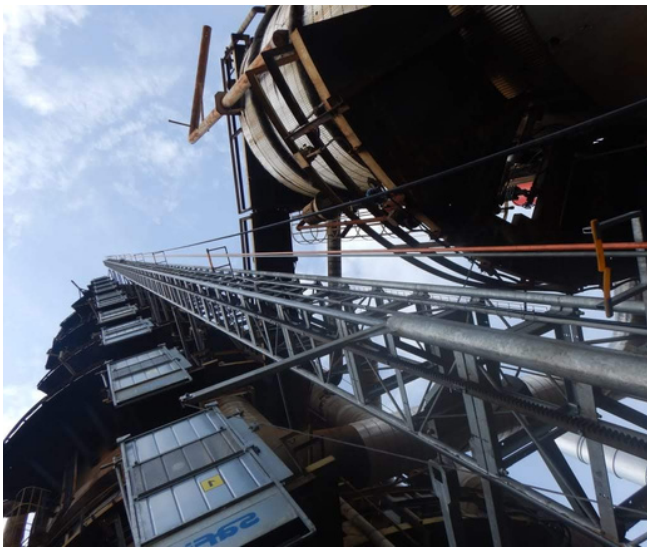
10. ANEMOMETER

As in most permanent high rise installations, an anemometer has been installed on the column end element. This allows the elevator to be taken out of operation in case of wind speeds higher than those for which the structure has been calculated, and - in case all doors are closed - to bring the cabin back to the ground to reduce the surface exposed to the strong wind.

11. INVERTER 55 KW

The inverter is housed in a pressurized enclosure on the ground floor to manage the hoist acceleration. The inverter is a regenerative type to feed the current generated during the descent of the machine into the grid; during the descent phase (when the motors actually become alternators) it releases mains voltage into the grid instead of using resistors to convert it into heat and disperse it into the environment.

Given the particular characteristics of the site, the solution was designed AD HOC because the standard devices normally used could not be installed due to the serious risk of a potentially explosive environment.



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TECHNICAL DATA

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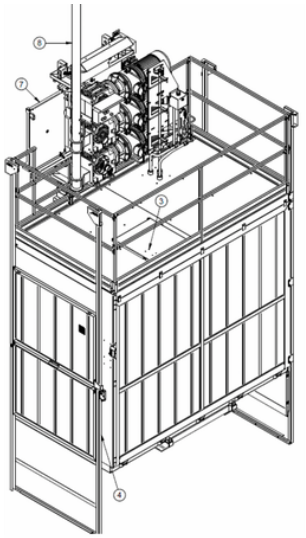
Mast element weight	105daN
Mast element height	1.48m
Guides total height (H)	89.5m (supplied 95m)
Guides working height	83.0m
Distance between anchorages	See fig. 1
N. of landings	1 (at the ground floor) + 10
Door internal dimensions (WxH)	1.40x2.10m
Cabin internal dimensions (WxLxH)	1.60x3.00x2.50m
Cabin weight	1700daN
Motor group weight	1000daN
Maximum N. of persons	30
Maximum payload	2500daN
Cabin door internal dimensions (WxH)	1.40x2.10m
N. of cabin access	2
Travelling speed	≈ 36m/min.
Supply voltage	380-400V
Supply frequency	50Hz
Brakes supply voltage and frequency	230V
Secondary circuit tension	24÷110V
Control panel at the ground	-
Noise level	80dBA

TAB. 3: Technical data

N. of gear-motors	3
Rack module	8
Motor pinion diameter	128mm (primitive)
Motor pinion N. of teeth	16
Parachute brake pinion diameter	128mm (primitive)
Parachute brake pinion N. of teeth	16
Gear-motors rated power	3x11kW
Gear-motor type	Bevel gear-motor



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GENERAL DATA

Type:	Rack and pinion lift – guided along vertical masts
Name (model):	**VISION AS 2500 HS PF**
Manufacturer:	SAFI GROUP S.r.l. Via S. Rocco, 8 - 31041 Cornuda (TV) - ITALY
Place of installation:	011S104 AREA FOC-II PT. PERTAMINA (PERSERO) RU IV CILACAP (IND)
Installed by:	SAFI S.r.l.
Standard references:	Standard **EN 81-20:2014** Standard **EN 81-77:2013** Standard **EN 12015:2014** Standard **EN 12016:2013** Standard **EN 15198:2007** Standard **EN ISO 80079-36:2016**

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