



15th INTERNATIONAL OPERATIONS & MAINTENANCE CONFERENCE IN THE ARAB COUNTRIES
UNDER THE THEME: “**SMART MAINTENANCE**” CONICIDE WITH THE 15TH ARAB MAINTENANCE EXHIBITION

Replacement Prioritizing of Major Electrical Asset at HV Substation

ABDULLAH ALGHAMDI



AGENDA

Asset Management (SAMI)

Gas Insulated Switch Gear

Methodology

Results



Asset Management (SAMI)



➤ Mission Statement.

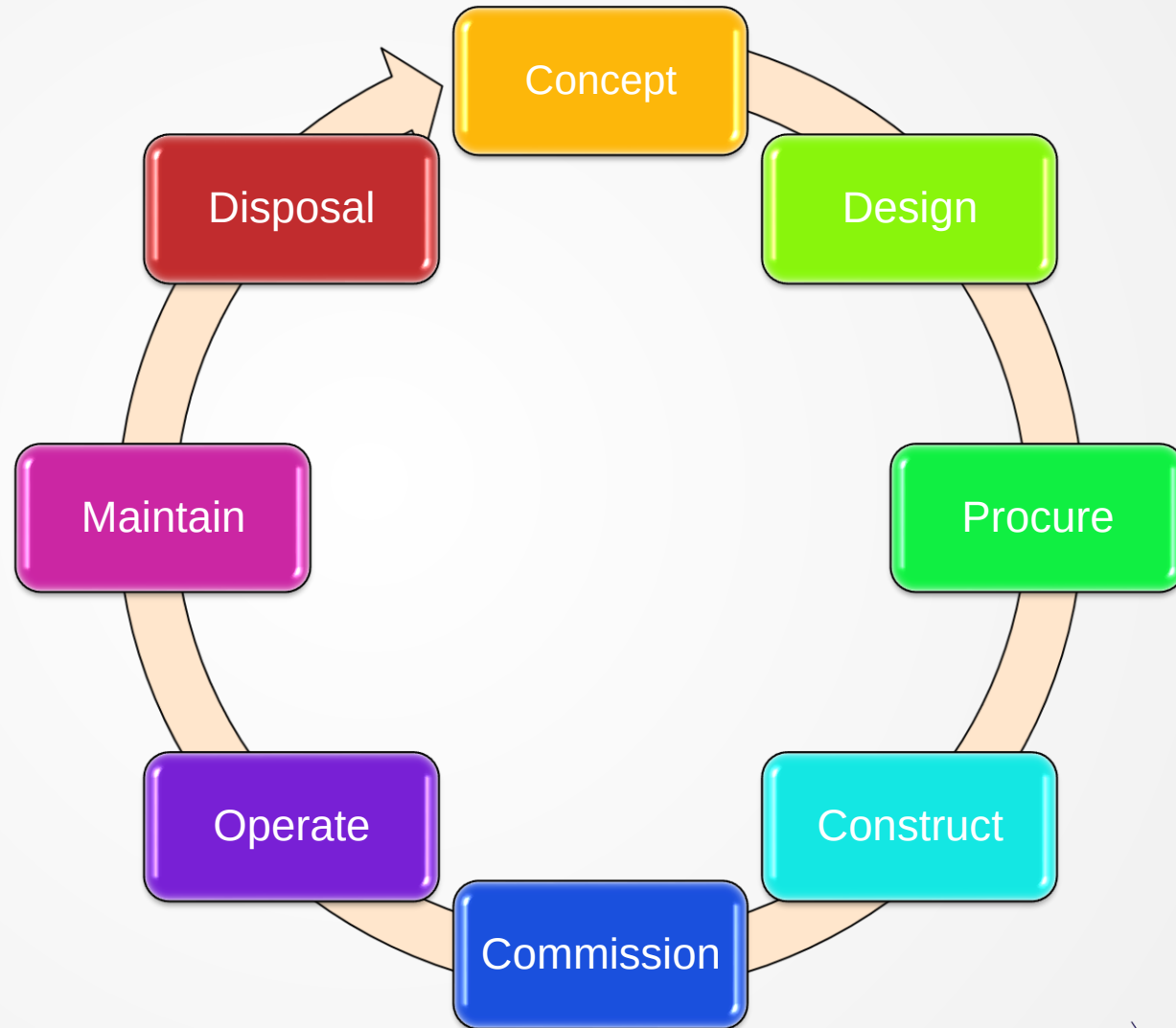
Taking into account the objectives of **National Grid SA**, the gained experience, the technological developments, and the electricity market evaluation, **Asset Management** will ensure the best performance of the grid by optimizing the **technical** solutions and their **economic** aspects over the asset **life cycle**.

➤ Asset versus Management

Asset Management is a set of **systematic** and **coordinated** activities and practices through which National Grid SA will improve its **performance** and **quality** by **optimally** managing the assets over their whole **life cycle**



Project Process





Key Word



Finance



Decision



Risk



Production



Responsibility



Compliance



Reputation



Sustainability



Efficiency

Asset Risk Management

➤ Health Index

When considering the range of equipment in various stages of health or operational readiness, a key challenge for an asset manager is to prioritize the various countermeasures available with regard to the equipment needing attention. In addition to the use of risk matrices, a promising approach to this challenge is to use a health index.

- Transformer
- **GAS INSULATED SWITCH GEAR**
- Underground cable
- Overhead line



GAS INSULATED SWITCH GEAR In National Grid SA

Gas Insulated Switch Gear

KSA

7645 bays

Manufacturers

- ABB
- ALSTOM
- SIMENCE
- HYOSUNG(HICO)
- HYUNDAI
- NISSAN ELECTRIC
- TOSHIBA
- MERLIN GREN
- FUJJI ELECTRIC
- HITASHI
- KONCAR
- LSIS
- MITUBISHI

ABB

ALSTOM

SIEMENS

HYOSUNG

HYUNDAI

KONČAR

TOSHIBA
Leading Innovation >>>

MERLIN GERIN

**NISSIN
ELECTRIC**

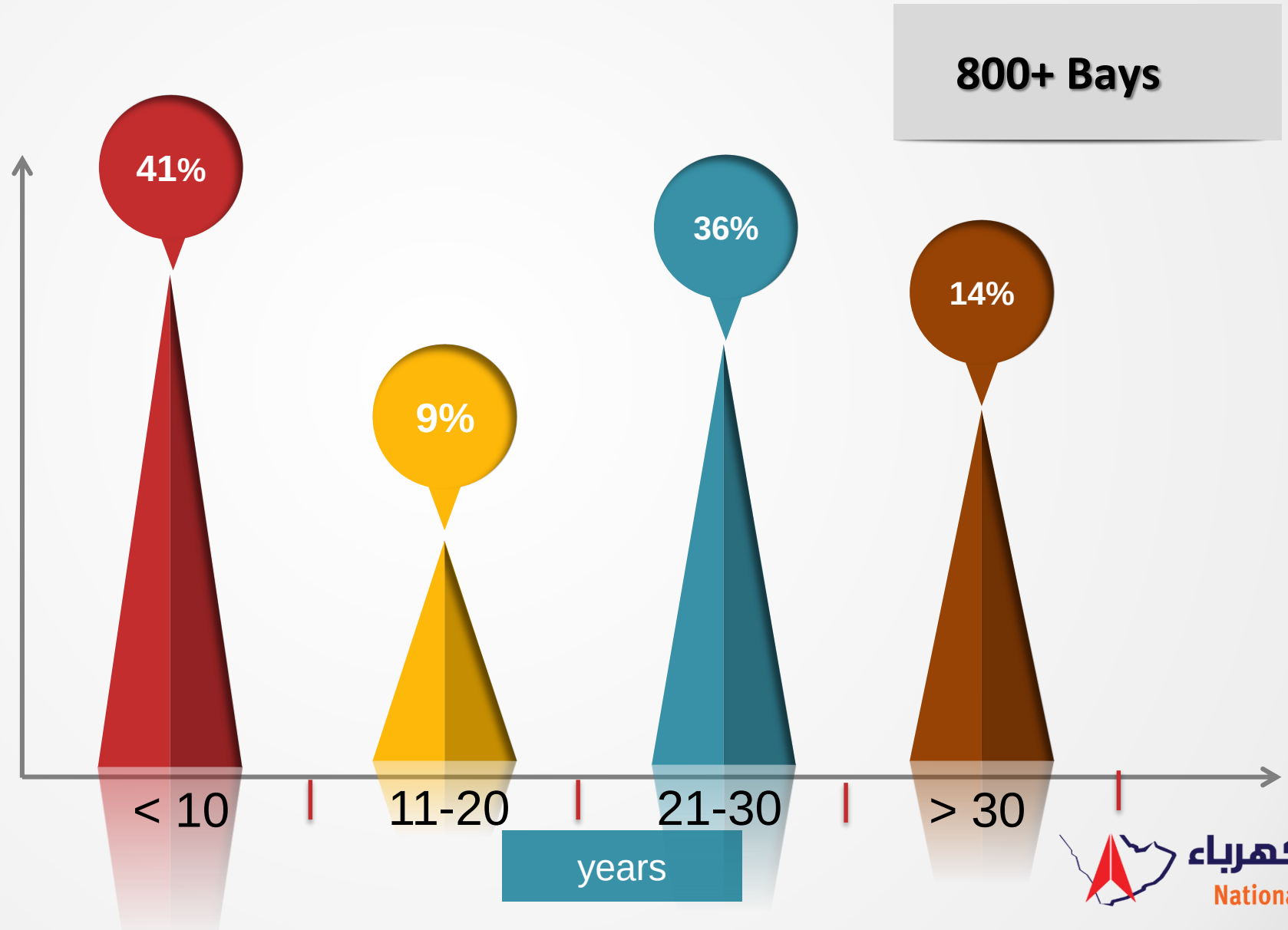
HITACHI

Fuji Electric

**MITSUBISHI
MOTORS**



Gas Insulated Switch Gear





METHODOLOGY

Factor #1: AGE RISK

$$\left(\left(a - \frac{a}{n} \right) * (b) \right) / (a) * 100\%$$

Where ;

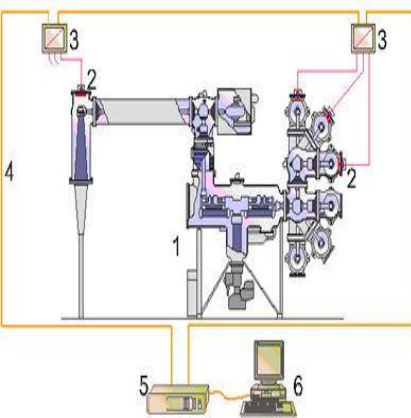
a=current purchased value.
b= number of years in service.
n= expected life

$$((A-B)/A)*C$$

Where;

A = years number that GIS should operate for.
B = Actual Age of GIS.
C = weight %

Factor #2: FAILURE RISK



FLASH OVER



**AUXILIARY
PARTS**



DESIGN



MECHANISM



SF6 LEAKAGE

Factor #3: SPARE PARTS RISK

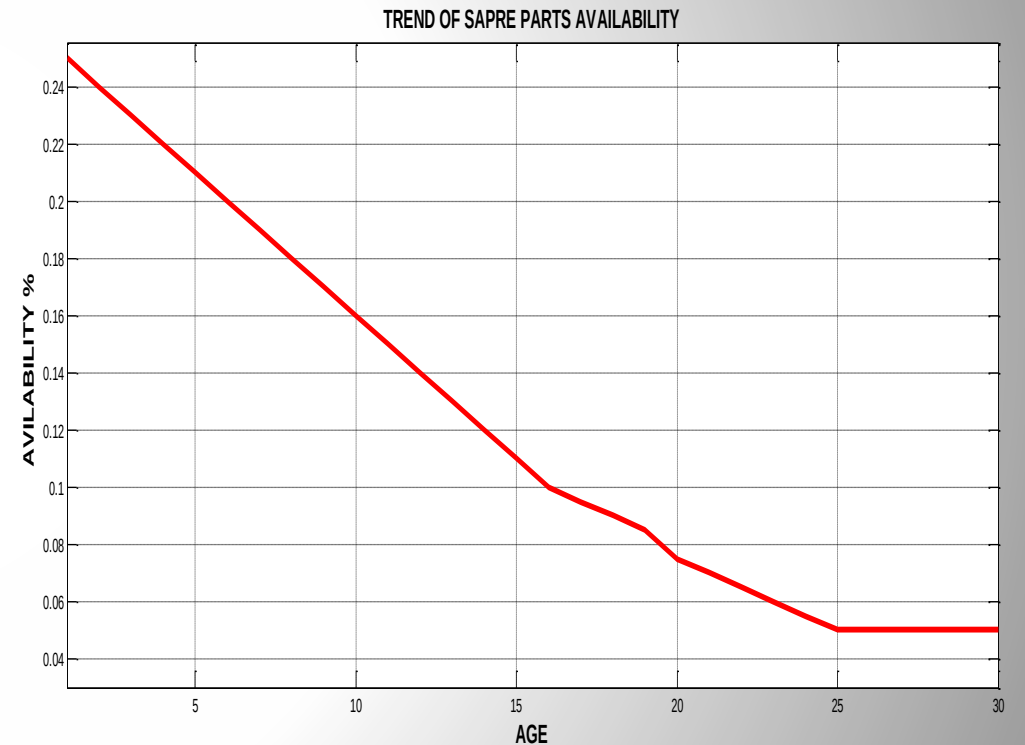
$$((A/B)*D)$$

Where;

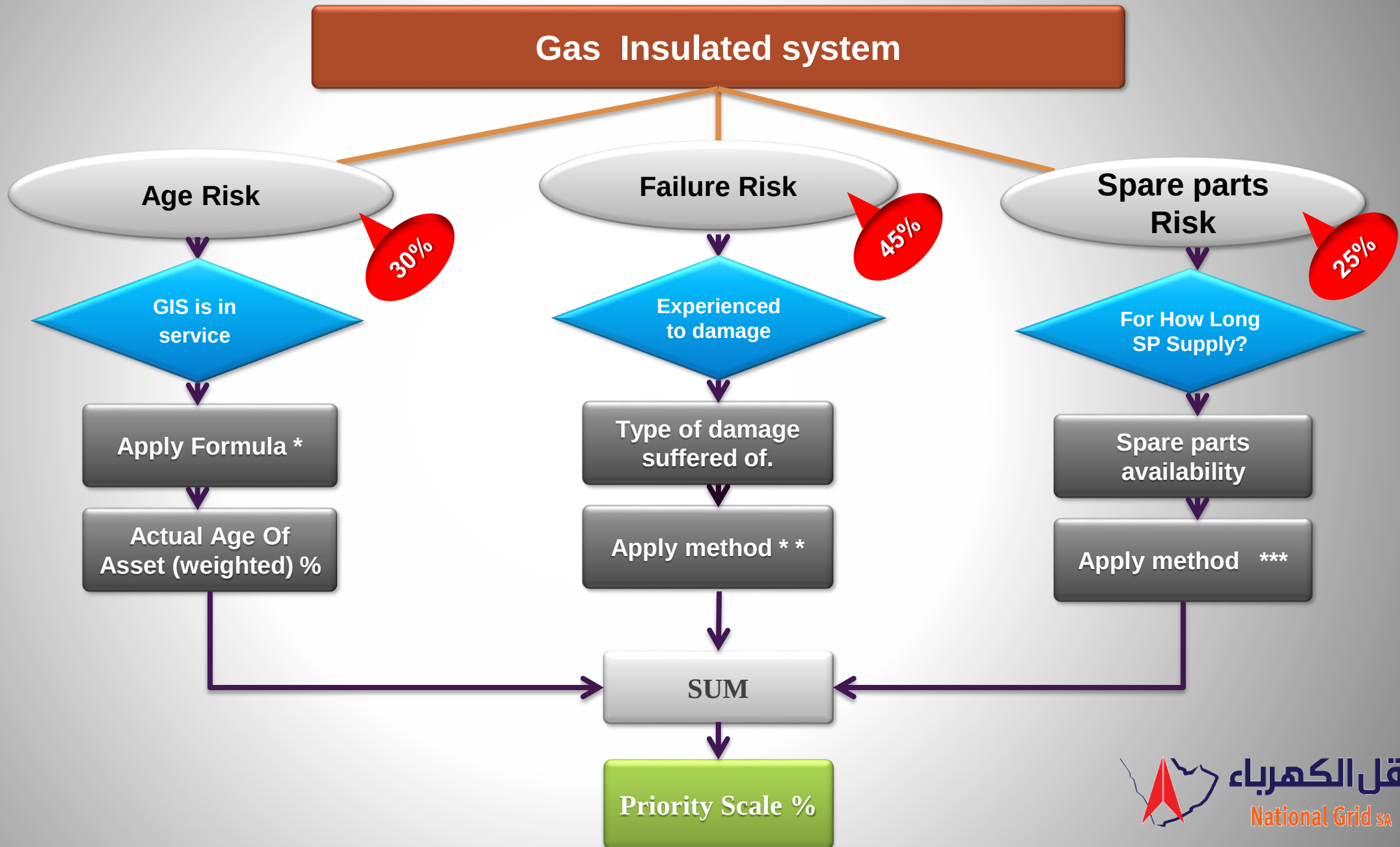
A = number which given as per figure.

B = 5 as number of zone considered.

D = scale of spare parts of 100%



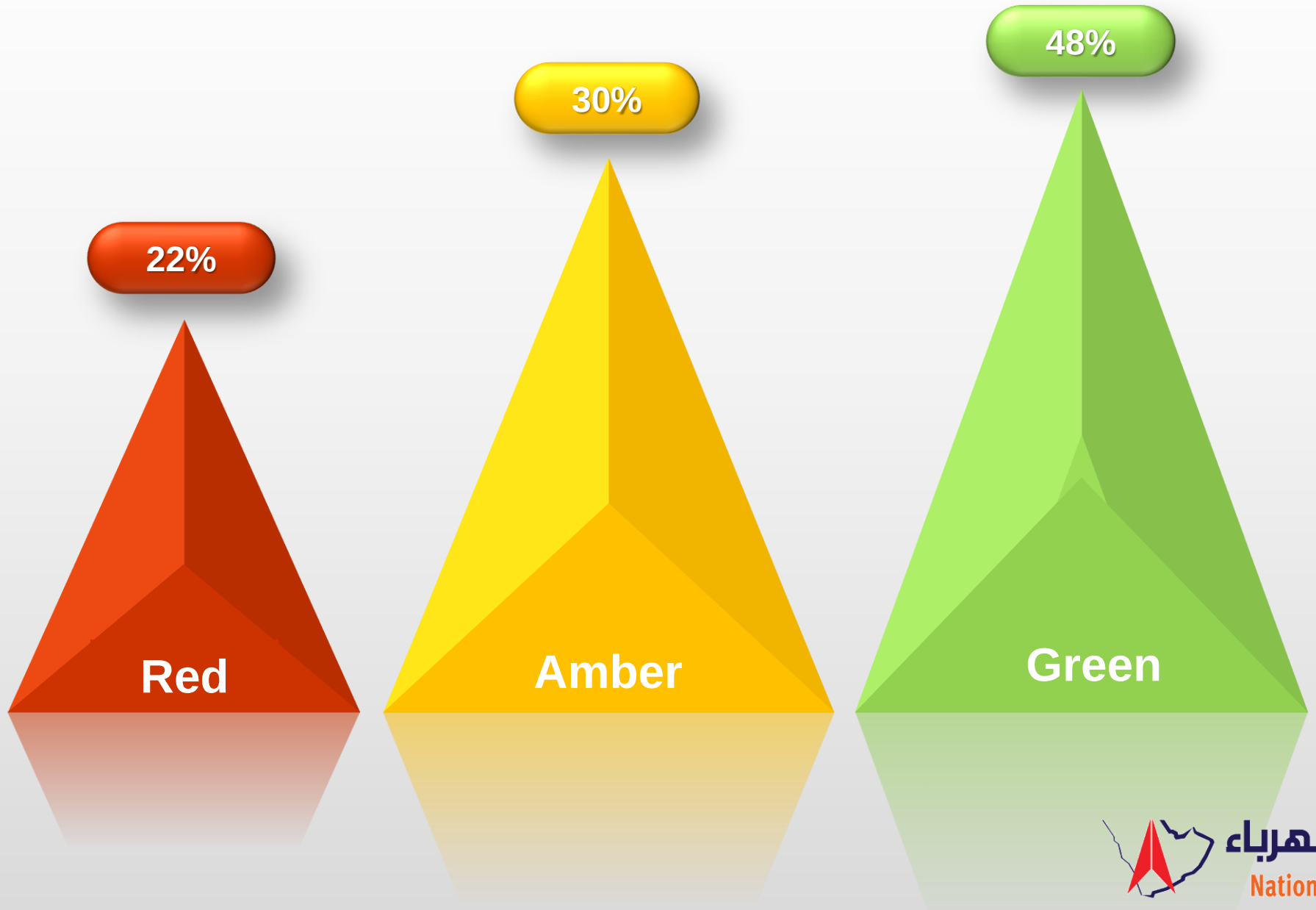
ALGORITHM





RESULT

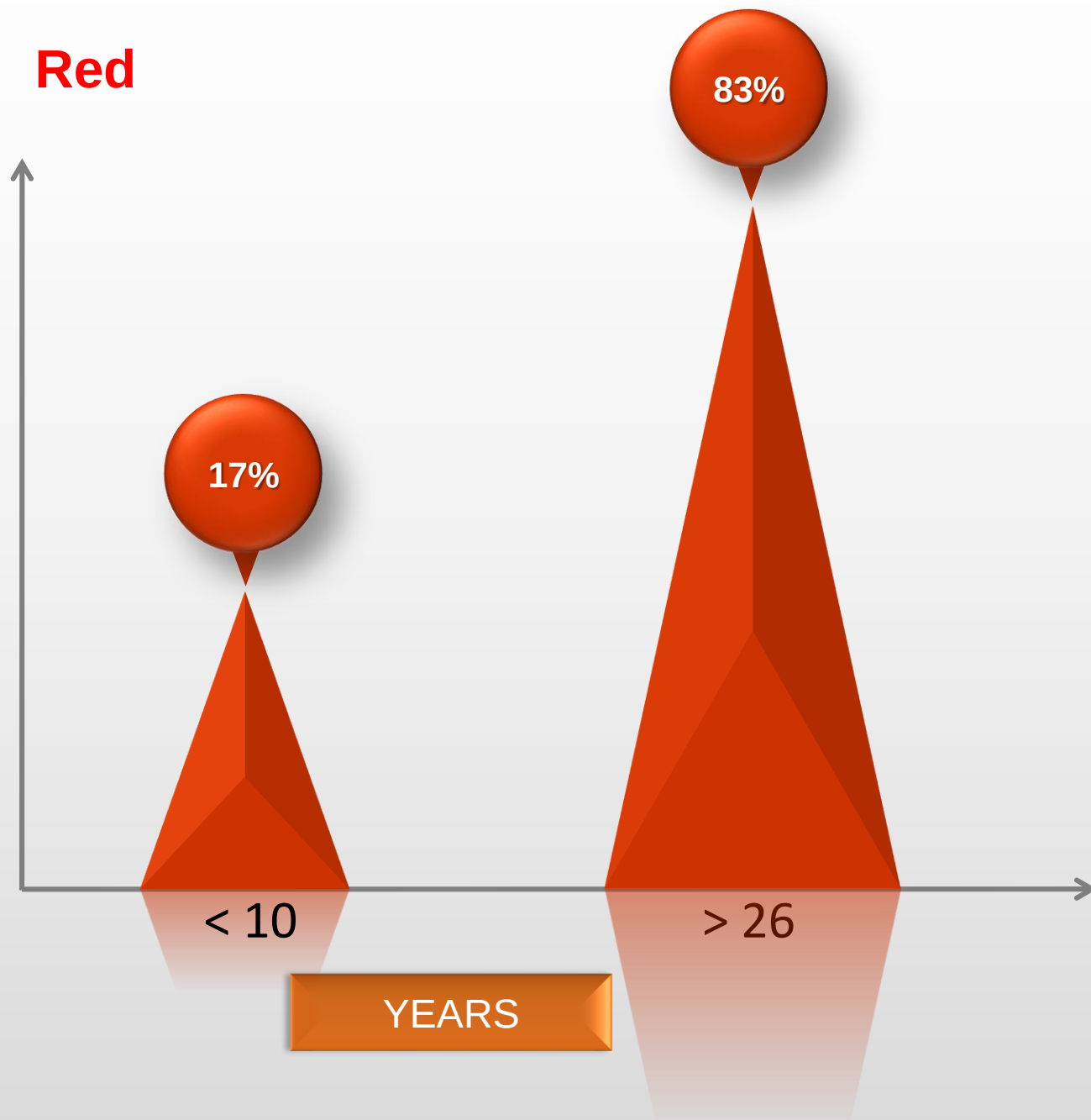
RESULT



نقل الكهرباء
National Grid SA

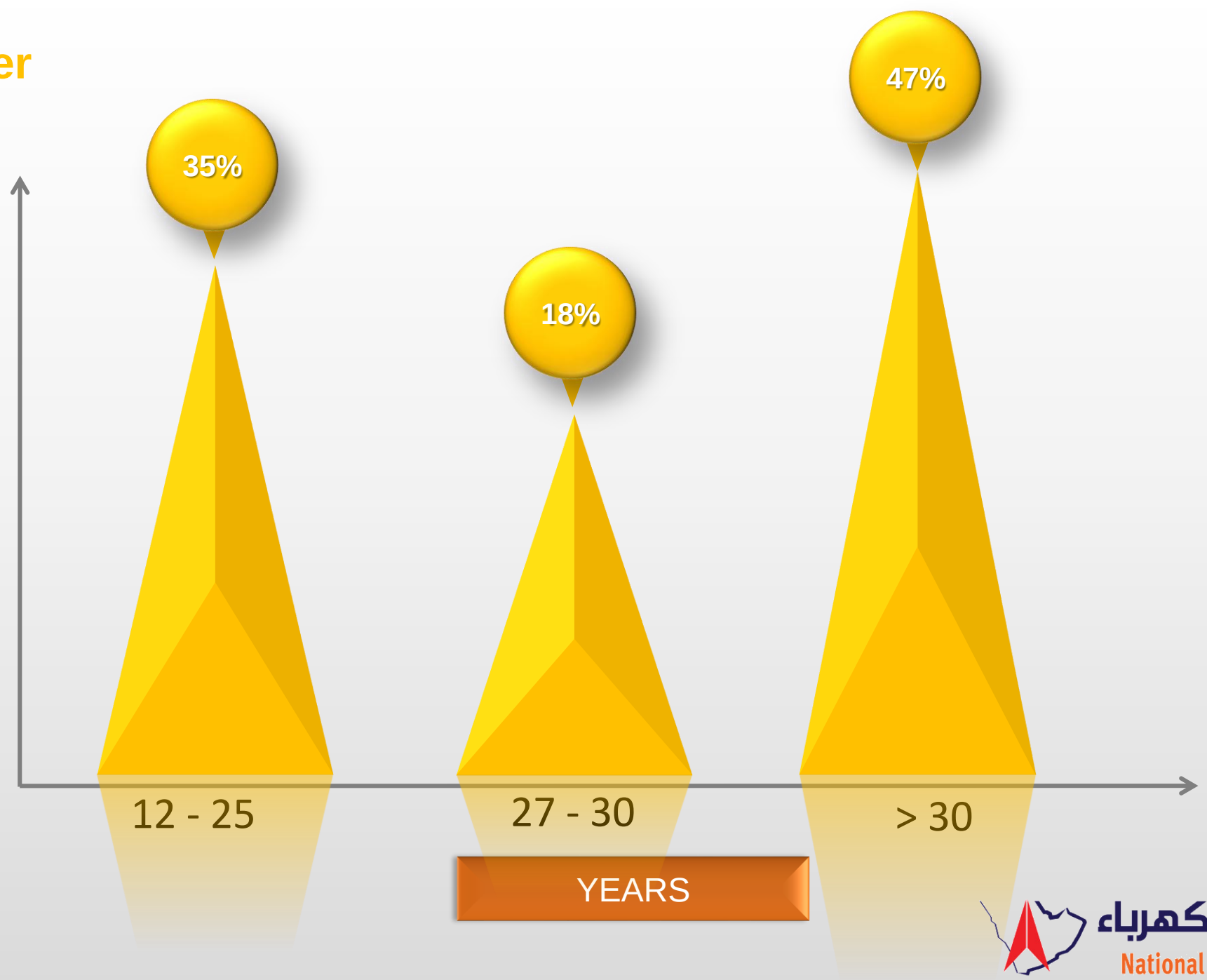


Red



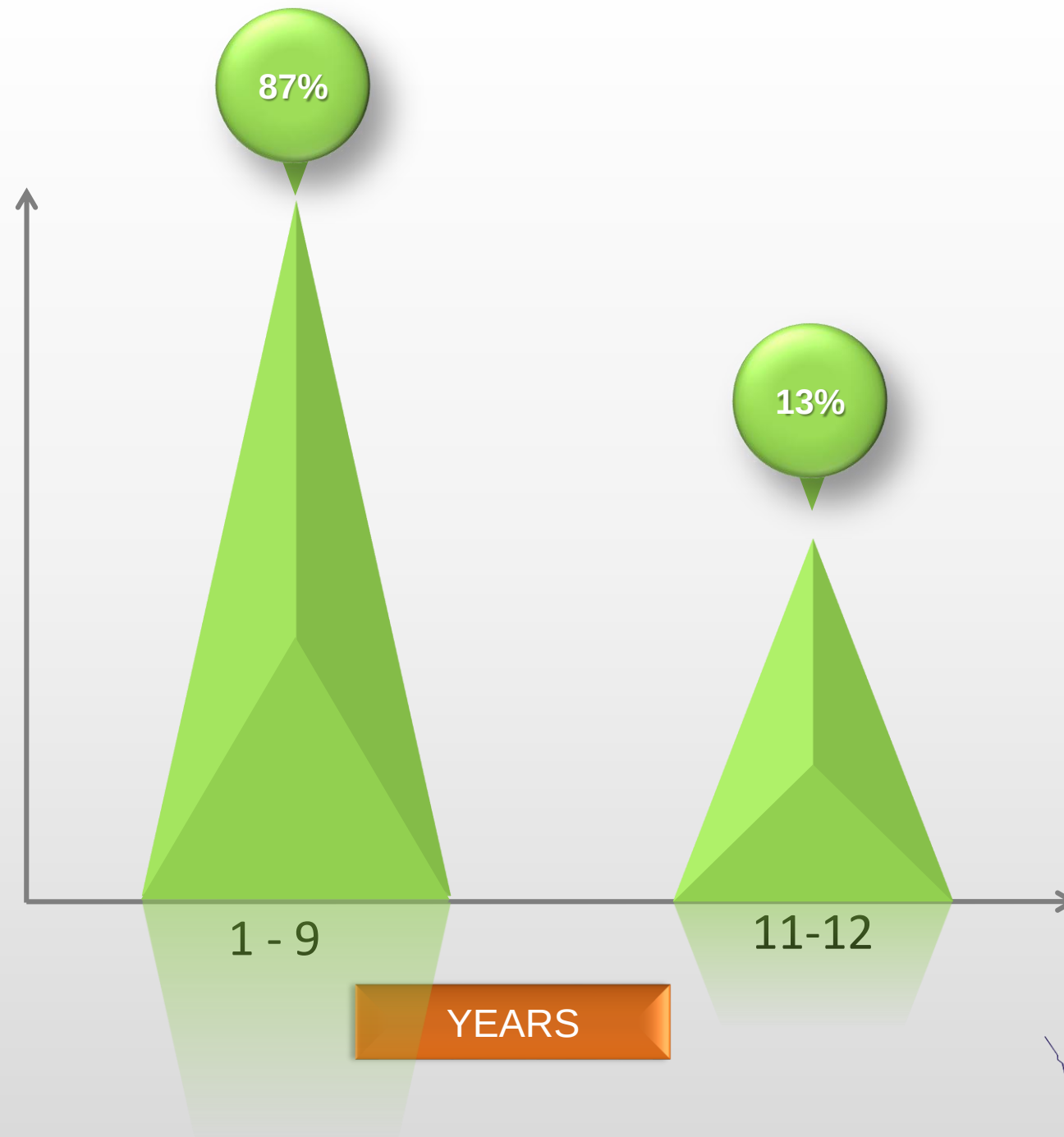


Amber

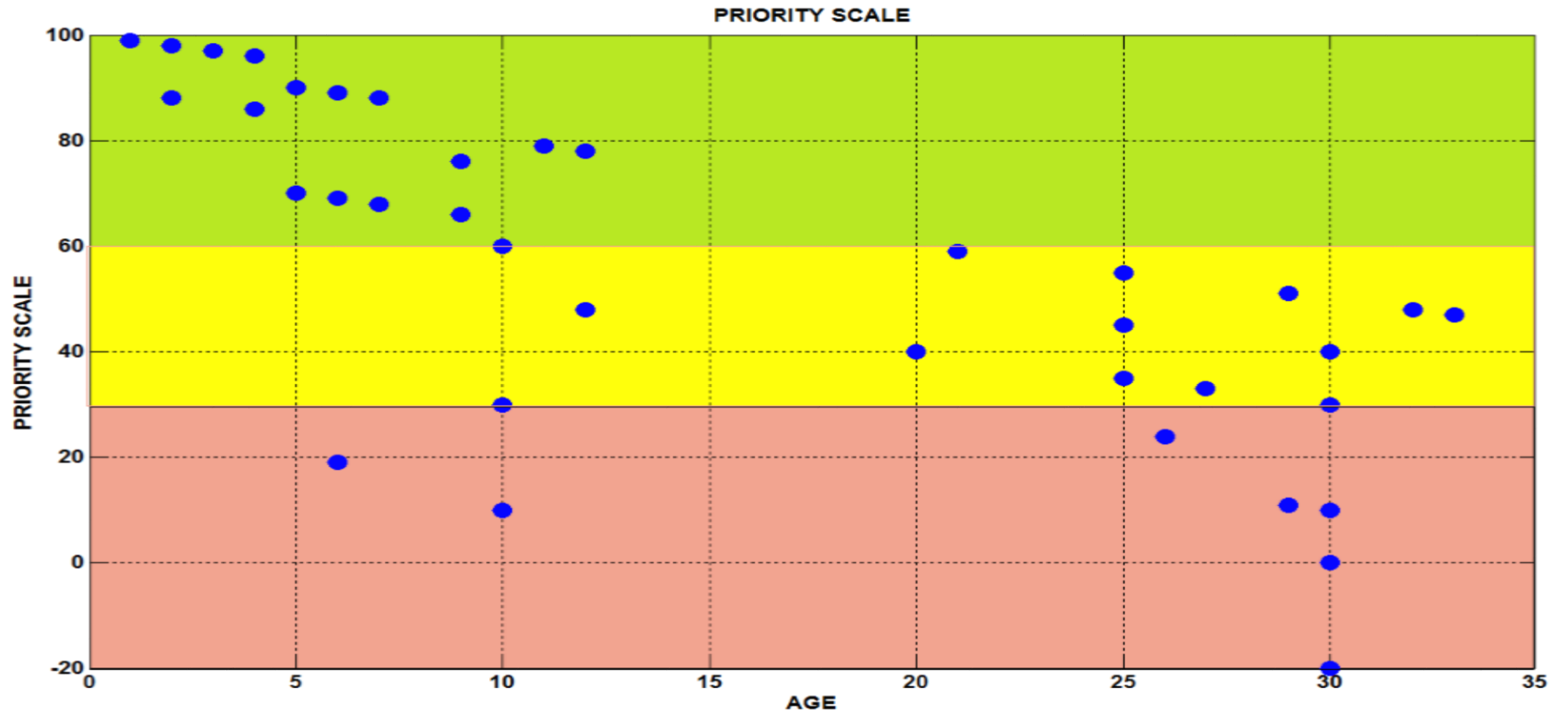




Green



RESULT



QUESTIONS ??

THANKS