

**Maintenance Engineering Society, Australia**

**Monitoring the Health of Health Care Assets**

**June 2007**

**John Dixon**

**FG Dixon Group**



## **Public Health Assets**

- **Asset Base approx \$16 Billion**
- **Major Annual Investment required to Sustain**
- **Demand for Services Growing approx 4%pa**
- **Delivery of Health Services Changing over time**
- **Balancing Asset and Service Needs is significant issue**
- **Asset base Ageing and Condition Deteriorating**

## **Public Health Assets**

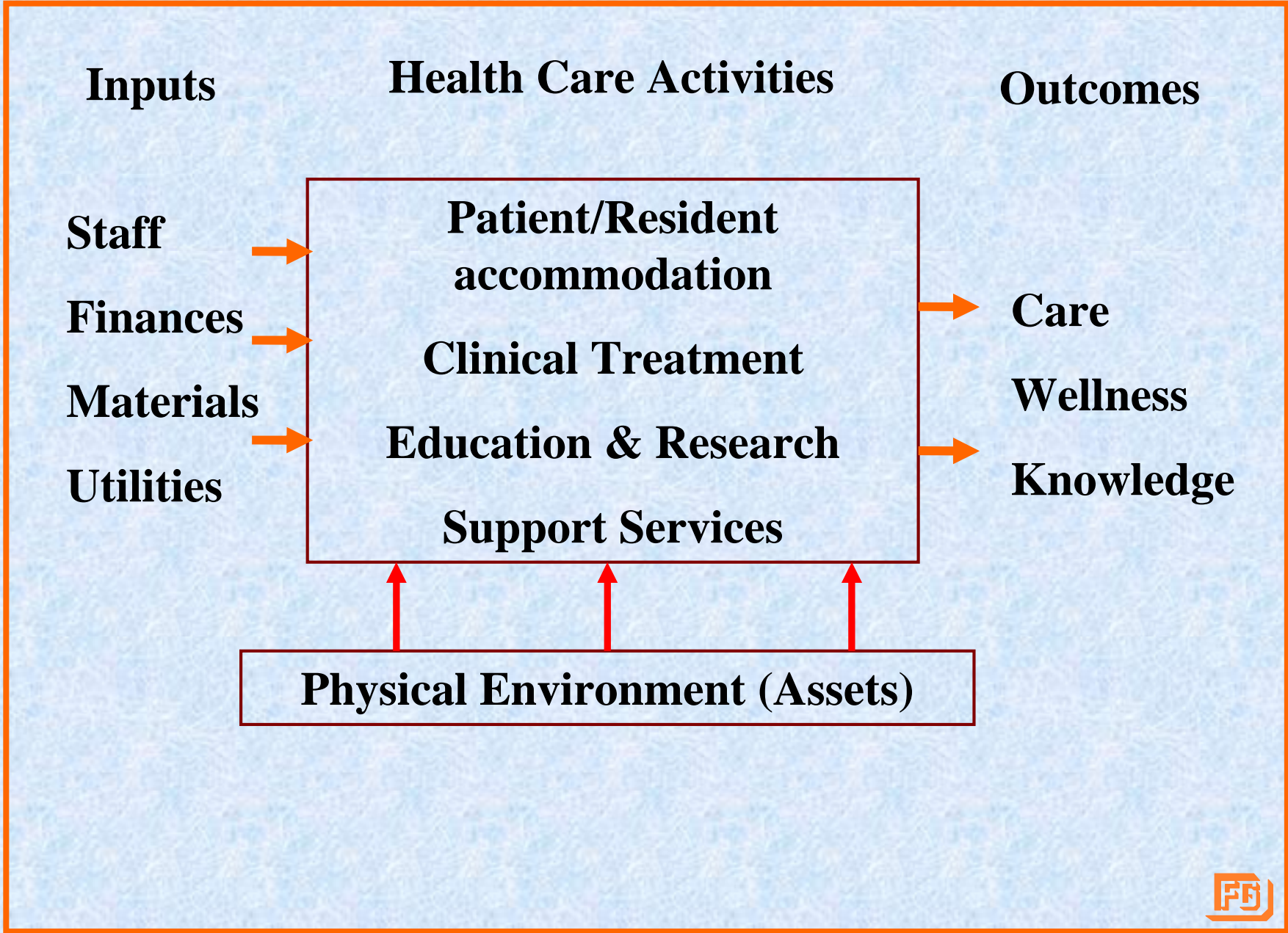
- **Total Operating Budget approx \$6 billion pa**
- **Capital (building) Replacement Program approx \$400m pa**
- **Much of this Expenditure politically driven**
- **Hospitals self-fund other ‘minor’ works programs**
- **Maintenance Expenditure \$60m-\$100m pa**
- **No wonder Asset base Condition Deteriorating**

## **Health Care Facilities**

- **Hospitals – from Tertiary Referral to Local Community**
- **Hospitals classified as Acute, Sub-acute**
- **Aged Care (Nursing Homes, Hostels)**
- **Community Health**
- **Supported Accommodation (mentally & physically disabled)**

# What do Hospitals Contain?

- **Buildings**
- **Plant and Building Services**
- **Equipment**
- **Special services**
  - **Patient accommodation**
  - **Treatment areas**
  - **Laboratories**
  - **Educational & Training**
  - **Support services**

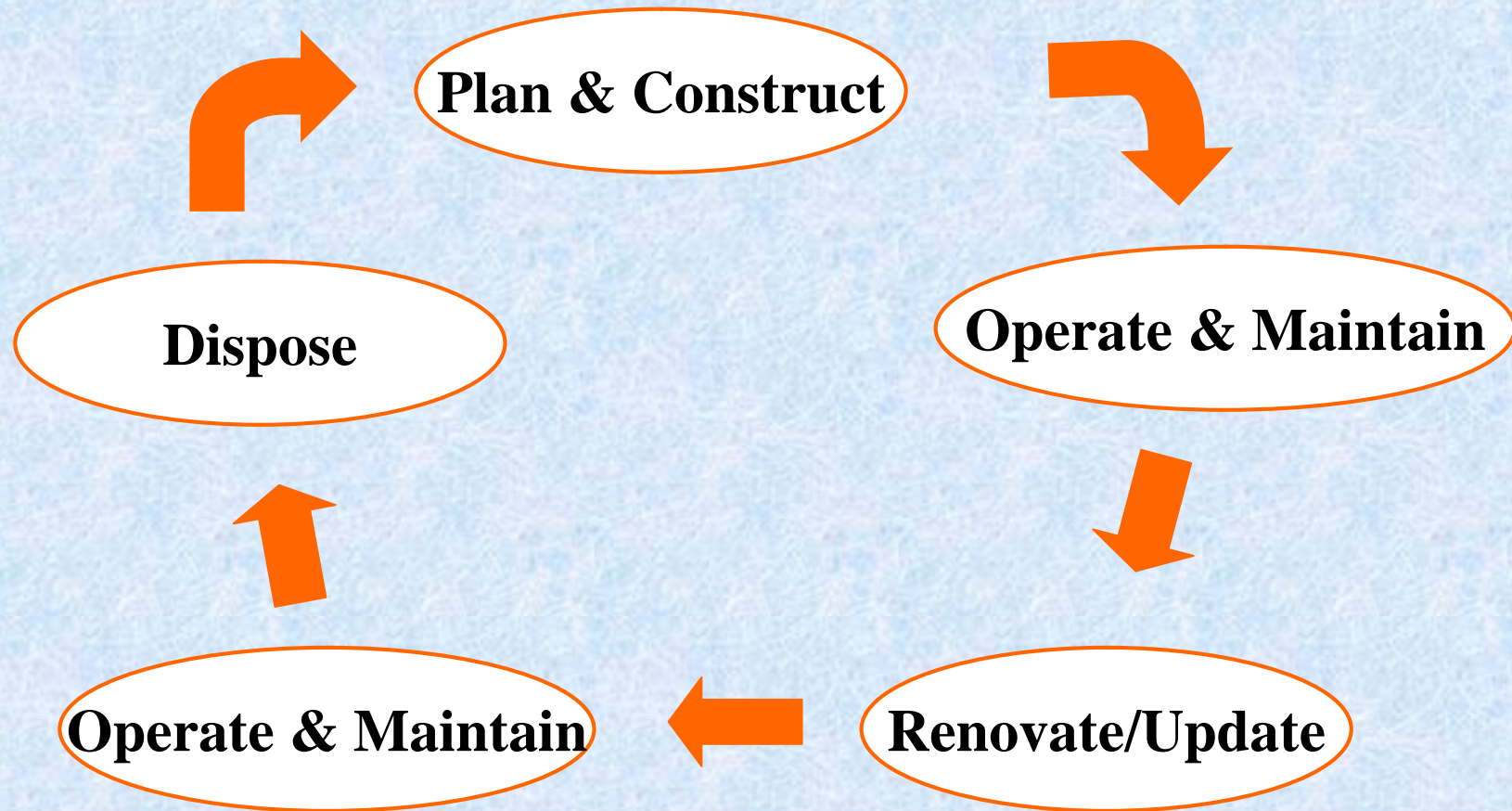


## **Definitions**

- **Assets – Physical environment of the Agency**
- **Management – Plan, organise, supervise, review**

**Asset Management involves planning, organising, supervising, reviewing activities to retain Physical environment in a condition enabling it to effectively perform its function**

# Asset Management Cycle



## **Asset Management Principles:**

**Wherever Assets are required to support service delivery, a Plan is needed to enable the assets to be properly managed**

**Components of the Plan include:**

- **Purpose (why are we doing it) - User needs, specifications**
- **Method (how do we do it) - asset management cycle**
- **Measure (how well are we doing) - key result areas**

# Asset Management Activities

## Inputs

Staff

Finances

Materials

Utilities



## Outcomes

Functional,  
Safe  
comfortable  
physical  
environment



**What do we want to achieve?**

**Convince Senior Management (CEO & Board) of the  
Benefits of Properly Managed Assets**



## **Who is the Audience**

- **DHS & Treasury (fund allocators)**
- **Senior Management & Board (fund holders)**
- **Peers (benchmarks)**

## **Base Level**

**We know that assets will deteriorate due to the effects of:**

- **Use**
- **Abuse**
- **Environment**
- **Age**

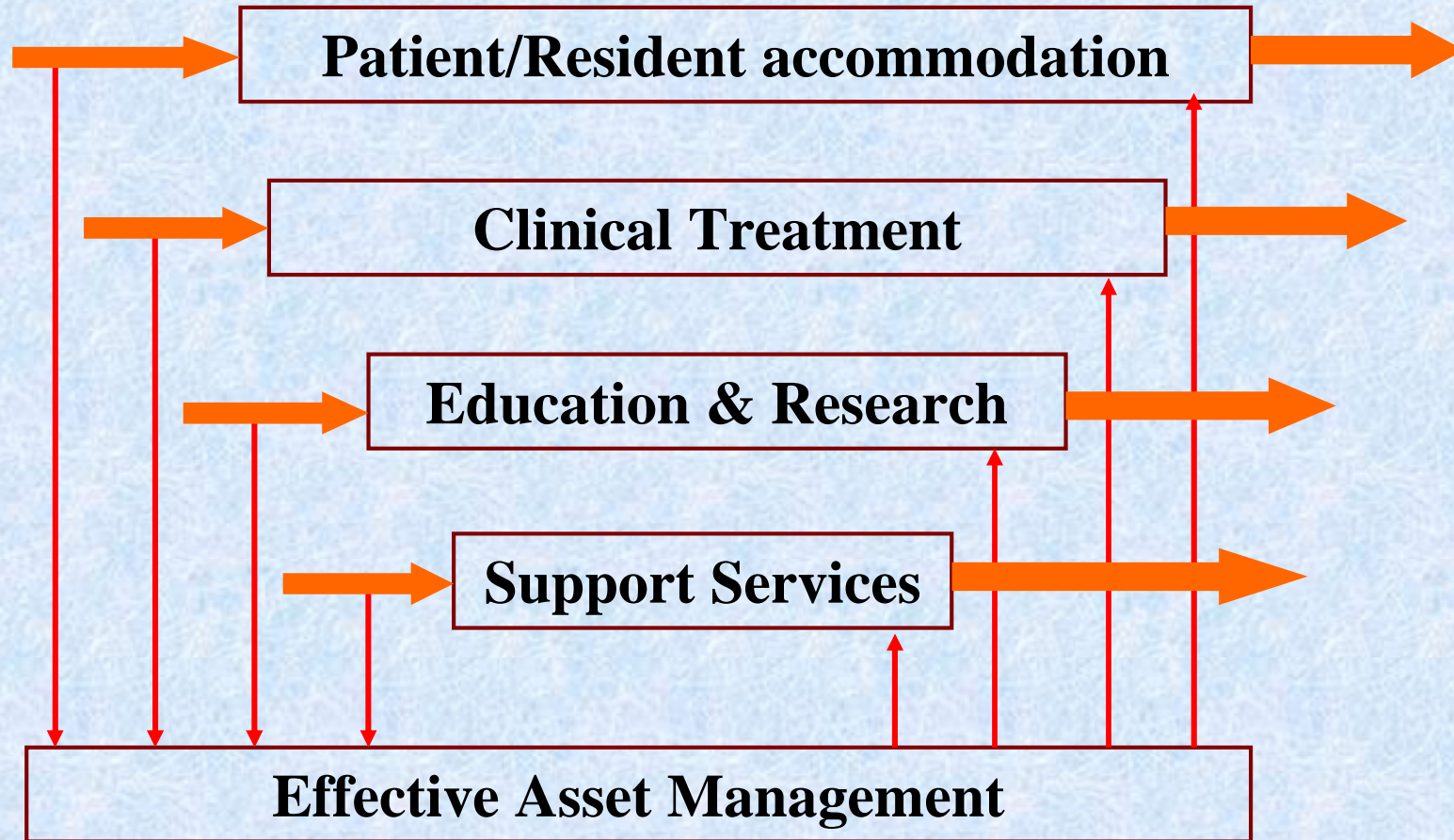
## **Support Service Delivery by:**

- **Retaining functionality (fit-for-purpose)**
- **Managing Risk**
- **Enabling Business Continuity**
- **Maintaining Throughput**
- **Optimising Cost of Owning Assets**
- **Minimising Environmental Impact**
- **Sustaining Staff morale/productivity**

**In short, Adding Value**



## Inputs



Properly fund Asset Management to Properly Support the Health Service



## **Triple Bottom Line (what they say)**

- **Economic Values – Financial Accountability**
- **Environmental Values – Care for the Planet**
- **Social Values – Responsibility to Staff and Community**

## **Attributes in terms of triple bottom Line:**

- |   |                                       |
|---|---------------------------------------|
| ➤ <b>Staff and systems applying Best Practice</b>                             | <b>Economic &amp;<br/>Social</b>      |
| ➤ <b>Management of Utilities</b>  | <b>Economic &amp;<br/>Environment</b> |
| ➤ <b>Management of Chemical use, Waste</b>                                    | <b>Environment</b>                    |
| ➤ <b>‘Welcoming’ atmosphere for the User<br/>(staff, residents, patients)</b> | <b>Social</b>                         |
| ➤ <b>Effective asset management practices</b>                                 | <b>All</b>                            |

## **Triple Bottom Line (what they mean)**

### **Cost**

➤ **Economic - Don't spend more than necessary**

➤ **Environment - don't allow bad things to occur**

### **Risk**

➤ **Social - don't hurt anyone, and avoid bad  
publicity**

## **Cost Management:**

- **Life Cycle Costing**
- **Maintenance Planning**
- **Backlog (condition-based) liability**

## **Risk Management:**

- **Identify Risks (Failure Mode & Effect Analysis)**
- **Analyse Risks (Likelihood & Consequence)**
- **Develop Strategies to Manage Risk**
- **Provide Information to Decision-makers**

## **Principles for Health Asset Managers**

- **Why does the Business exist (Mission and Vision)**
- **What Risks does the Business face**
- **How do the Facilities support the Business**
- **What is the Regulatory environment**
  
- **(The Business doesn't exist for the benefit of the Asset management personnel)**



## Key Asset Attributes

<b>Function</b>	Fit-for purpose, supports service delivery	Cost
<b>Safety &amp; Compliance</b>	Safe & compliant with requirements of OH&S, Standards, Codes & Guidelines	Risk
<b>Available</b>	Utilisation, consequences of unavailability	Risk & Cost
<b>Health &amp; Amenity</b>	Hygiene, risks of cross infection Importance to clients of comfort & appearance	Risk
<b>Efficiency</b>	Outputs vs Inputs (staff, energy, maintenance)	Cost

## **Assets performing well lead to:**

- **Hygiene (to reduce risk of infection)**
- **Compliance with standards**
- **Reliable systems and services (availability)**
- **Care for environment**
- **Comfort and well-being**

## **Non-performing assets affect Business by:**

- **Increasing infection rates**
- **Reducing effectiveness/efficiency**
- **Inability to undertake clinical activities**
- **Risk of non-compliance**
- **Reducing comfort and well-being**
- **Reducing client satisfaction**

## **Effective Asset Management allows:**

- **Clear Management and Operational Framework**
- **Facilities continue to meet User Needs**
- **Risks identified and managed**
- **Decisions based on credible data**
- **Appropriate Funding**
- **Appropriate Skills and Resources**

**In short, Measurable Value added to the Enterprise**



## **Asset Performance Measures**

- **Functionality**
- **Cost Indices (activity, area, replacement value)**
- **Backlog maintenance liability**
- **Facility Condition**
- **Availability (Uptime)**
- **Statutory Compliance**
- **Safety incidents**
- **Plant/Process Efficiency**
- **Environmental Impact**
- **Fault Rates (Reliability)**

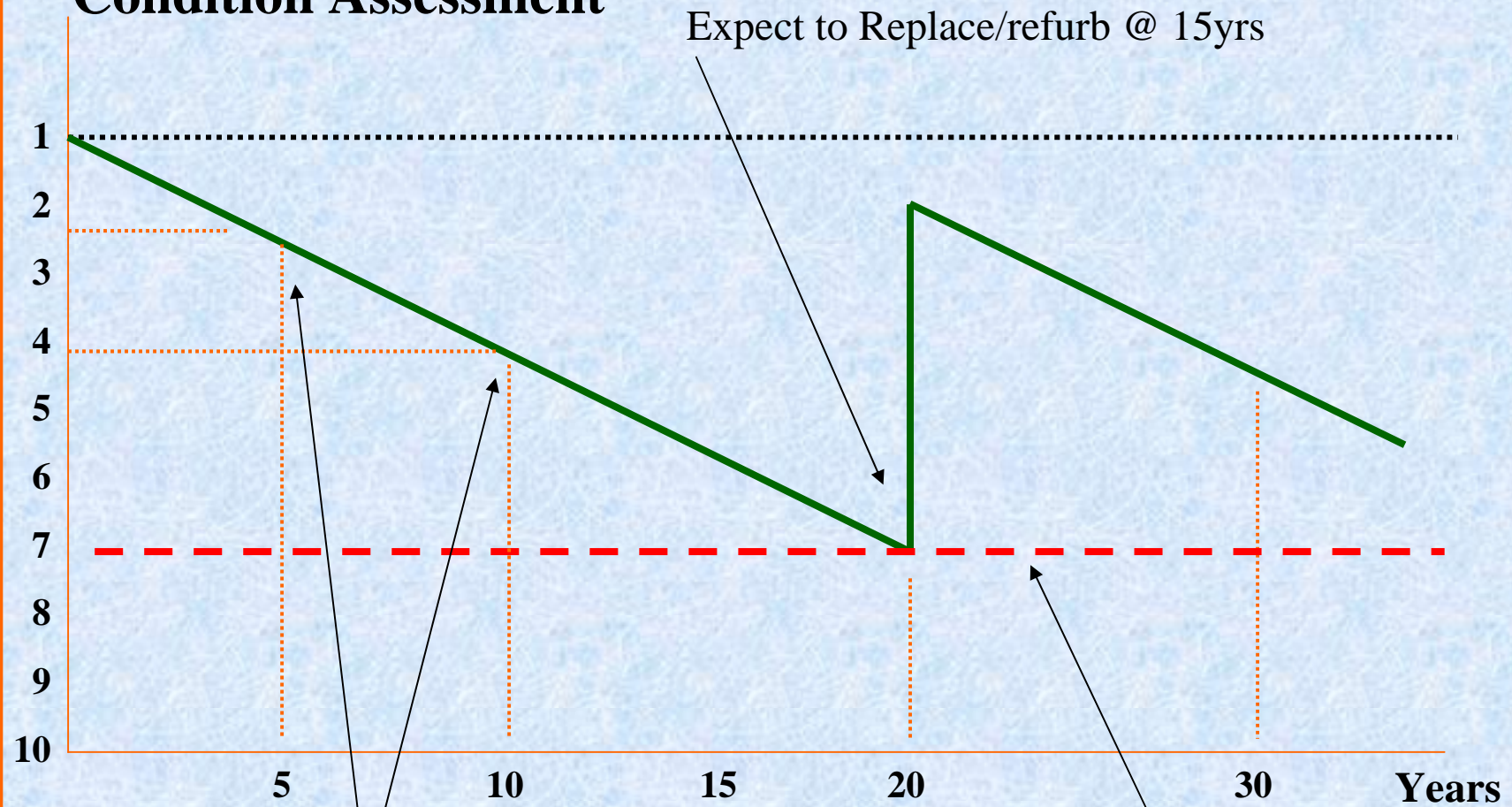
## Condition Assessment

No	Short Explanation
1	New Building/condition
2	As new condition; no visible signs of wear and tear or defects
3	Good condition with some signs of wear and tear commensurate with the age and use of the building
4	More significant wear and tear but no evidence of degradation of the element
5	Some minor degradation of the element which could potentially shorten life
6	Significant degradation of the element which could lead to failure
7	Evidence of minor isolated failure in an element which will reduce future life
8	Evidence of multiple failures and the inability of the element to continue to satisfactorily service the original intended purpose
9	Significant evidence of failure of the element and failure to provide design purpose
10	Total failure of the element

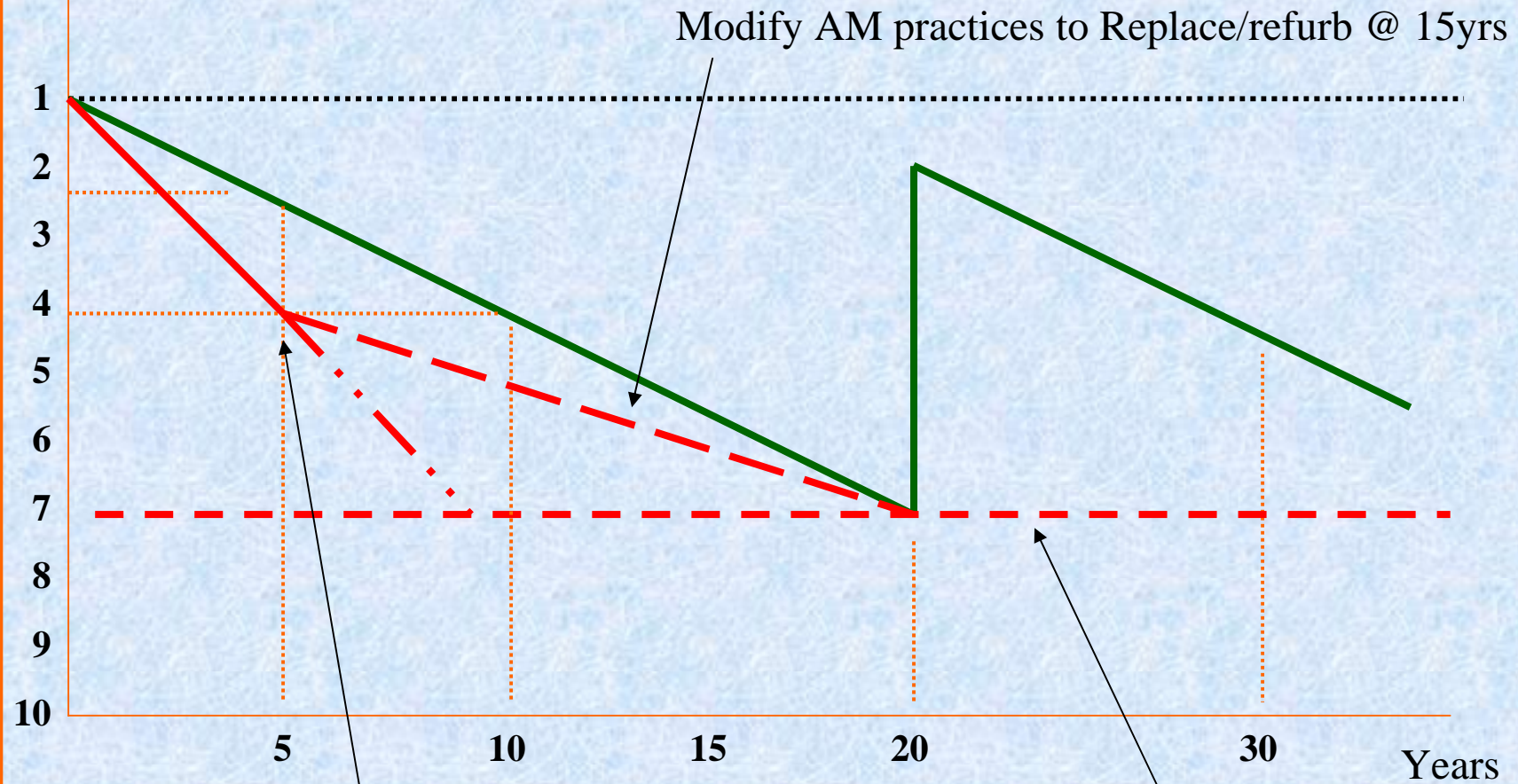
## Condition Assessment

$$\text{Replacement Year} = \frac{\text{Condition (Intervention-New)}}{\text{Condition (Now-New)}} \times \text{Year (assessed) - Year (New)}$$

# Condition Assessment



# Condition Assessment



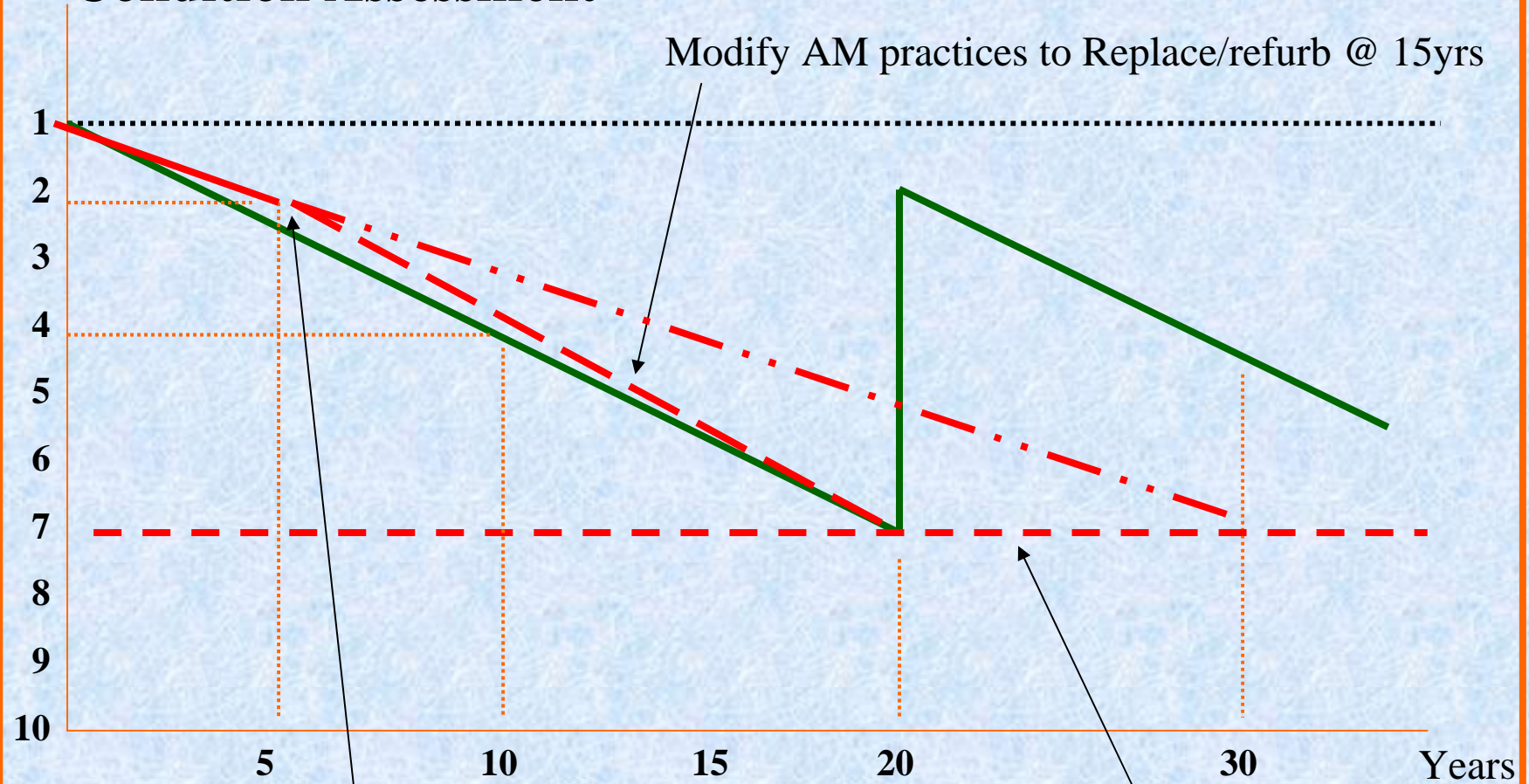
Condition Rating 4 not 2-3 @ 5yrs

Expect to Replace/refurb @ 9yrs

Intervention Level



# Condition Assessment



Condition Rating 2 not 2-3 @ 5yrs  
Expect to Replace/refurb @ 30yrs



**Because it can be counted  
doesn't mean that it counts**

*Albert Einstein*



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(Ford Prefect, *The Hitch Hikers Guide to the Galaxy*)



# **Risk Management**

## **Mitigation**

- **Seek Order-of-Magnitude Improvements**
- **Initiate Easy/Low Cost measures even where risks appear low**
- **Identify Common Modes of Failure**
- **Complex Systems may introduce Additional Risks**
- **Examine non-Capital and Capital Solutions**
- **Develop Rigorous Test Procedures**
- **Establish Appropriate Maintenance Plans**
- **Test the Plan Regularly and Record the results**

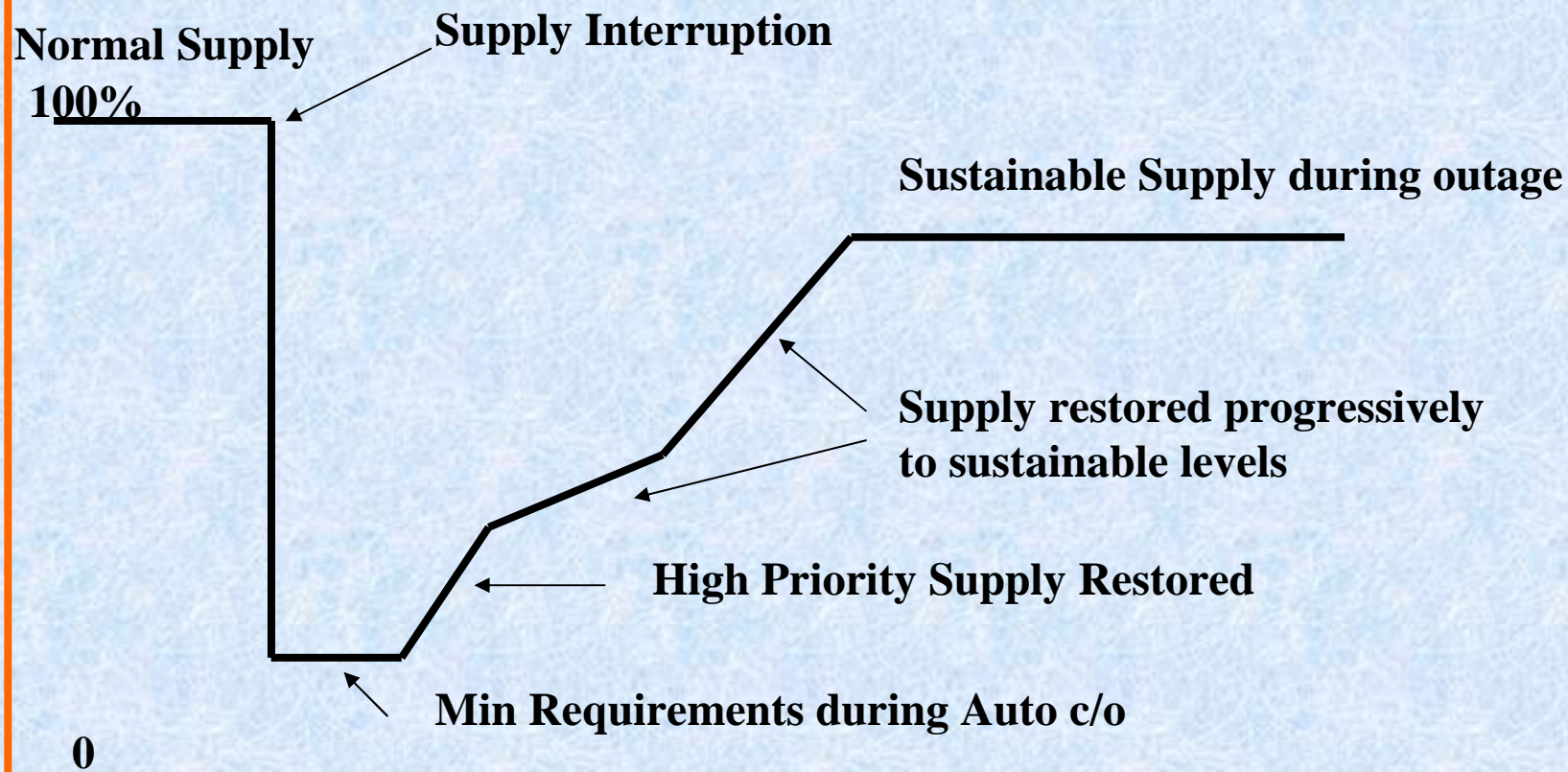


## **Business Continuity (Utilities) Plan**

### **Aim:**

- **To enable Critical Needs to be met Immediately/Automatically)**
- **Restore High Priority Services within a Short Time**
- **Expand Supply Capability over time to Sustainable Levels**

# Business Continuity (Utilities) Plan



## **Essential Engineering Services**

- **Utilities and Key Engineering Services necessary to sustain the activities of the Agency**
- **Utilities are delivered through ‘pipes & wires’**
- **Other Key Engineering Services provided through on-site processes (eg lifts, air conditioning) or transported to site (eg medical gases, fuel)**

## Essential Engineering Services:

<b>Utilities</b>	<b>Key Engineering Services</b>
<b>Electricity</b>	<b>Steam</b>
<b>Water</b>	<b>Fuel (eg, diesel LPG)</b>
<b>Communications (External)</b>	<b>Communications (Internal)</b>
<b>Gas</b>	<b>Medical Gases</b>
<b>Sewer Drainage</b>	<b>Fire Services</b>
<b>Storm Water Drainage</b>	<b>HVAC</b>
	<b>Lifts</b>

# Utilities

<b>Electricity</b>	<b>Power &amp; lighting, equipment, plant operation,</b>
<b>Water</b>	<b>Steam, sanitising, drinking/cooking, bathing, flushing, cleaning</b>
<b>Communications (External)</b>	<b>Voice &amp; data, external</b>
<b>Gas</b>	<b>Steam-raising, heating, hot water, cooking</b>
<b>Sewer Drainage</b>	<b>Off-site discharge of (approved) wastes</b>
<b>Storm Water Drainage</b>	<b>Off-site discharge of rain water</b>

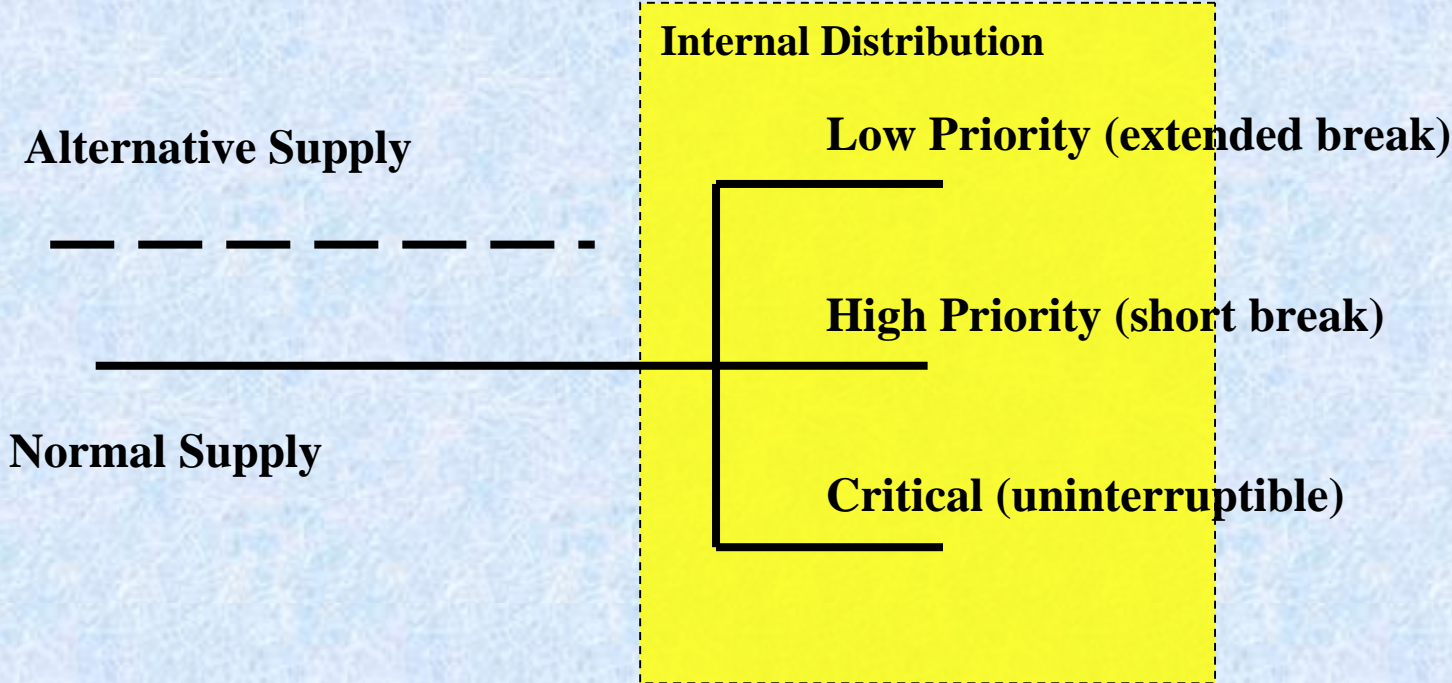


# Key Engineering Services

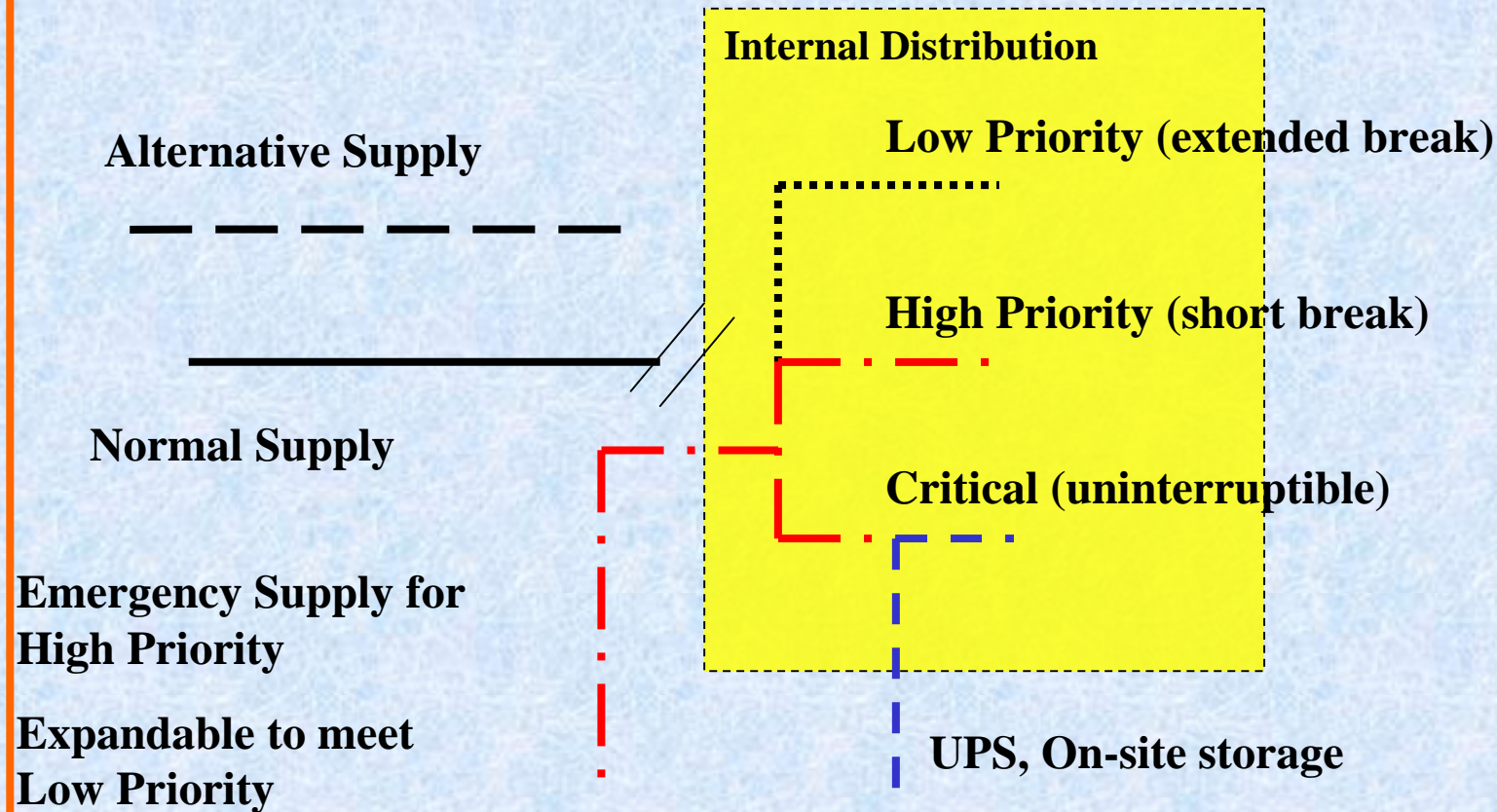
<b>Steam</b>	<b>Sterilisers, sanitisers, heating cooking</b>
<b>Fuel (eg, diesel, LPG)</b>	<b>Emergency Generators, Boilers</b>
<b>Medical Gases</b>	<b>Medical Air, oxygen, suction, nitrous oxide</b>
<b>Communications (Internal)</b>	<b>Voice &amp; data, internal</b>
<b>Fire Services</b>	<b>Detection, alarm, suppression</b>
<b>HVAC</b>	<b>Heating, ventilation, air conditioning</b>
<b>Lifts</b>	<b>Patient transport, public, service lifts</b>



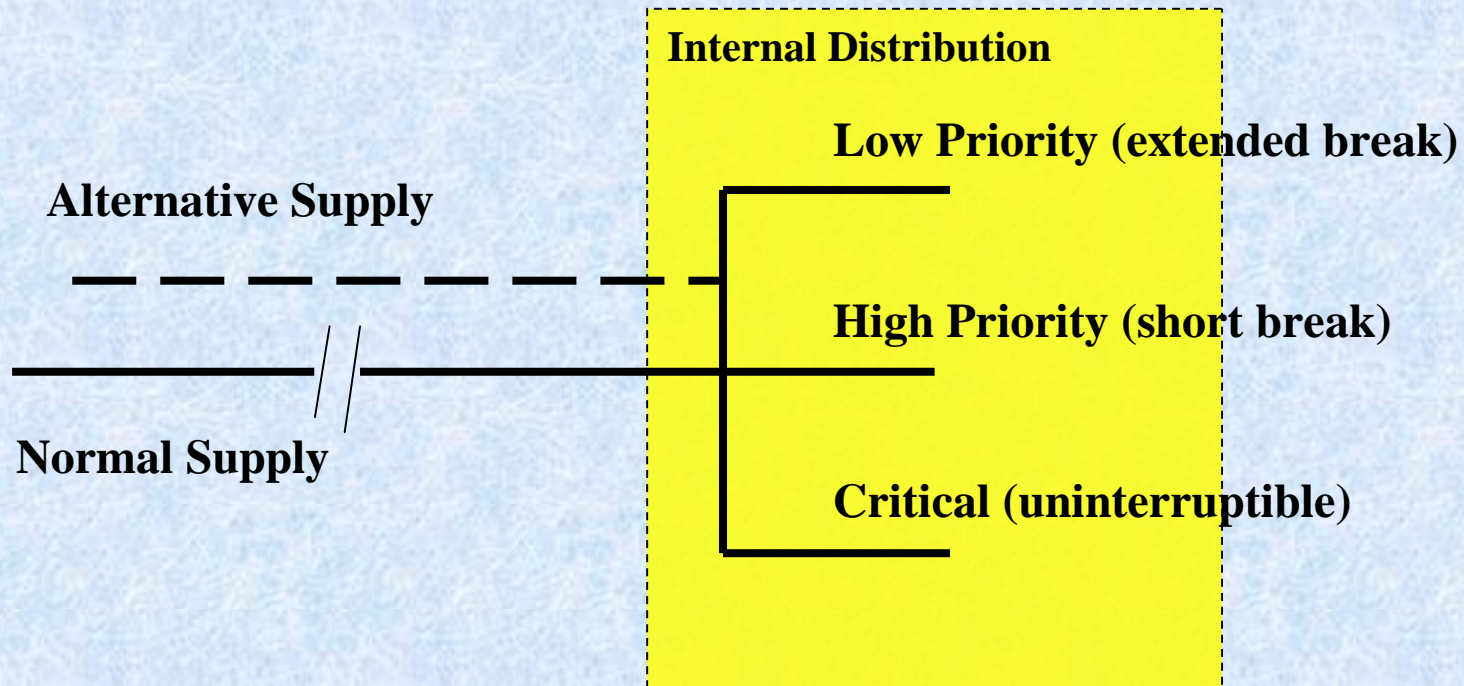
# Utilities Schematic – Normal Supply



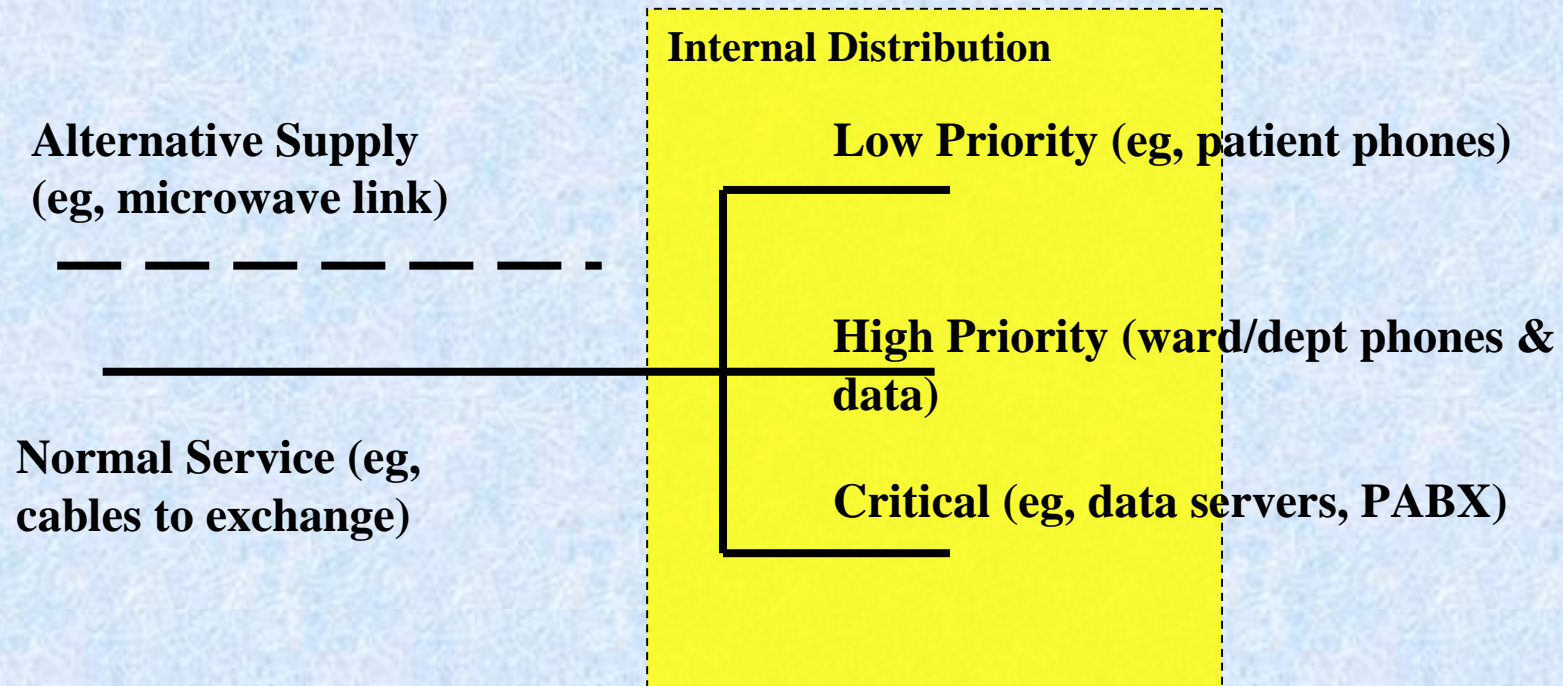
# Utilities Schematic – **Emergency Supply**



# Utilities Schematic – Alternative Supply



# Utilities Schematic – Communications



## **Facility Functional Area Priorities:**

- **Critical**                      **Virtually uninterrupted services required to sustain activities**
- **High Priority**                **Restoration of services is required within short time to sustain activities**
- **Low Priority**                 **Delay in restoration of services is acceptable**