

Maintenance Engineering Society, Australia

Monitoring the Health of Health Care Assets

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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

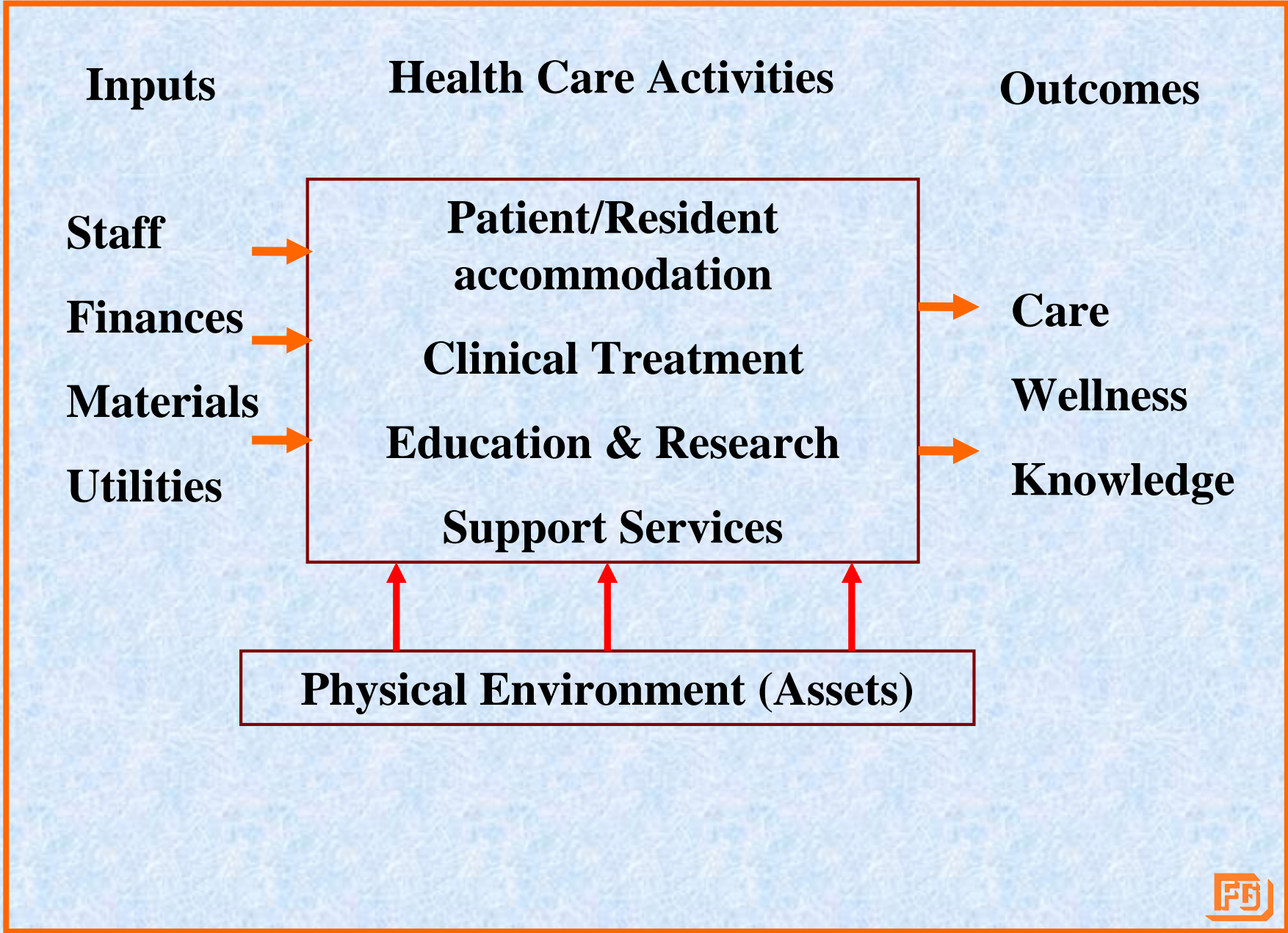
- **Total Operating Budget approx \$6 billion pa**
- **Capital (building) Replacement Program approx \$400m pa**
- **Much of this Expenditure politically driven**
- **Hospitals self-fund other 'minor' works programs**
- **Maintenance Expenditure \$60m-\$100m pa**
- **No wonder Asset base Condition Deteriorating**

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**

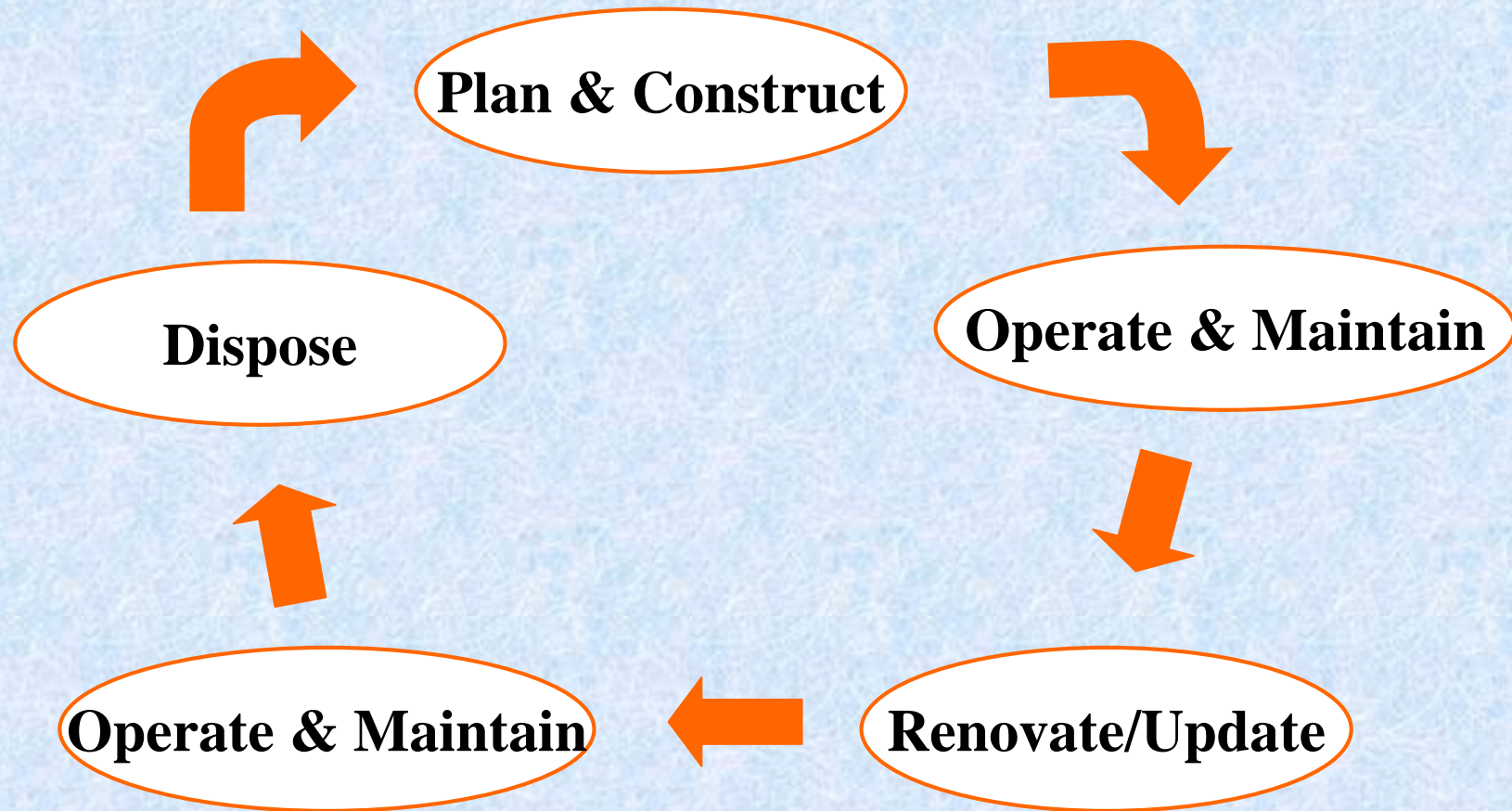


Definitions

- **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



Plan & Construct

Operate & Maintain

Renovate & Update

Dispose & Replace



Outcomes



Functional,

Safe

comfortable

physical

environment

Asset Management Principles



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**

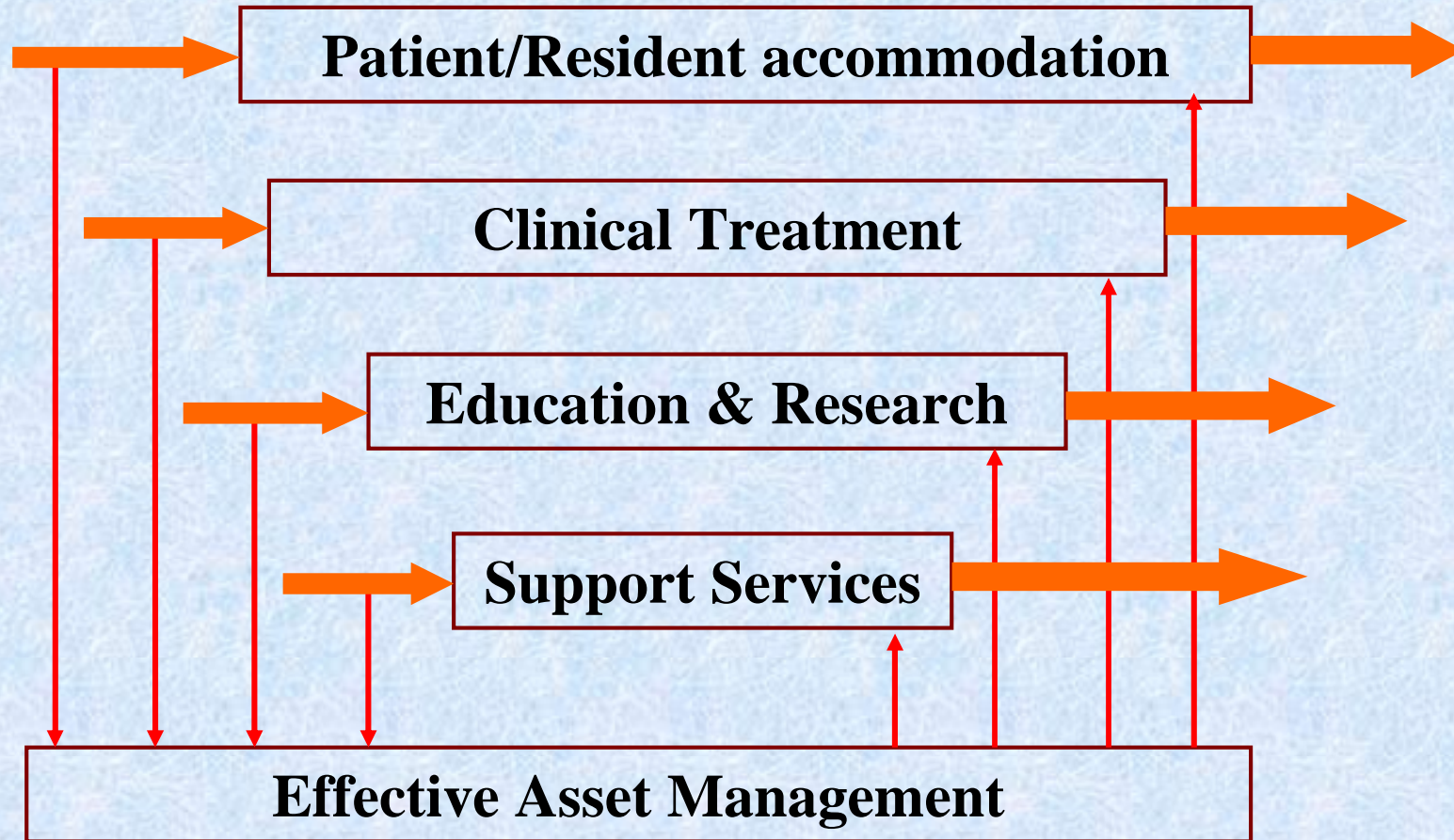
Support Service Delivery by:

- **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:

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

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

Function	Fit-for purpose, supports service delivery	Cost
Safety & Compliance	Safe & compliant with requirements of OH&S, Standards, Codes & Guidelines	Risk
Available	Utilisation, consequences of unavailability	Risk & Cost
Health & Amenity	Hygiene, risks of cross infection Importance to clients of comfort & appearance	Risk
Efficiency	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)**

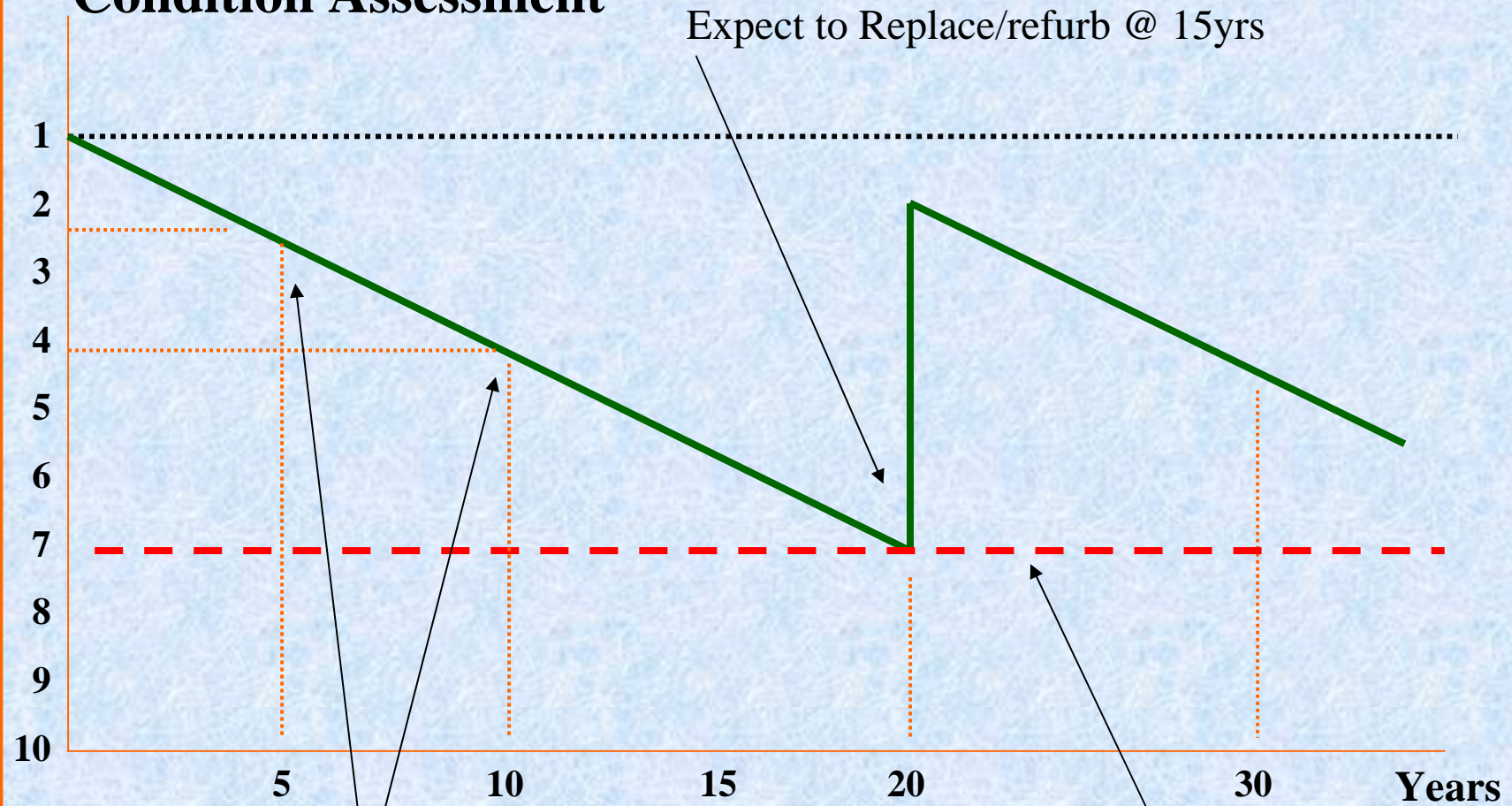
Condition Assessment

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

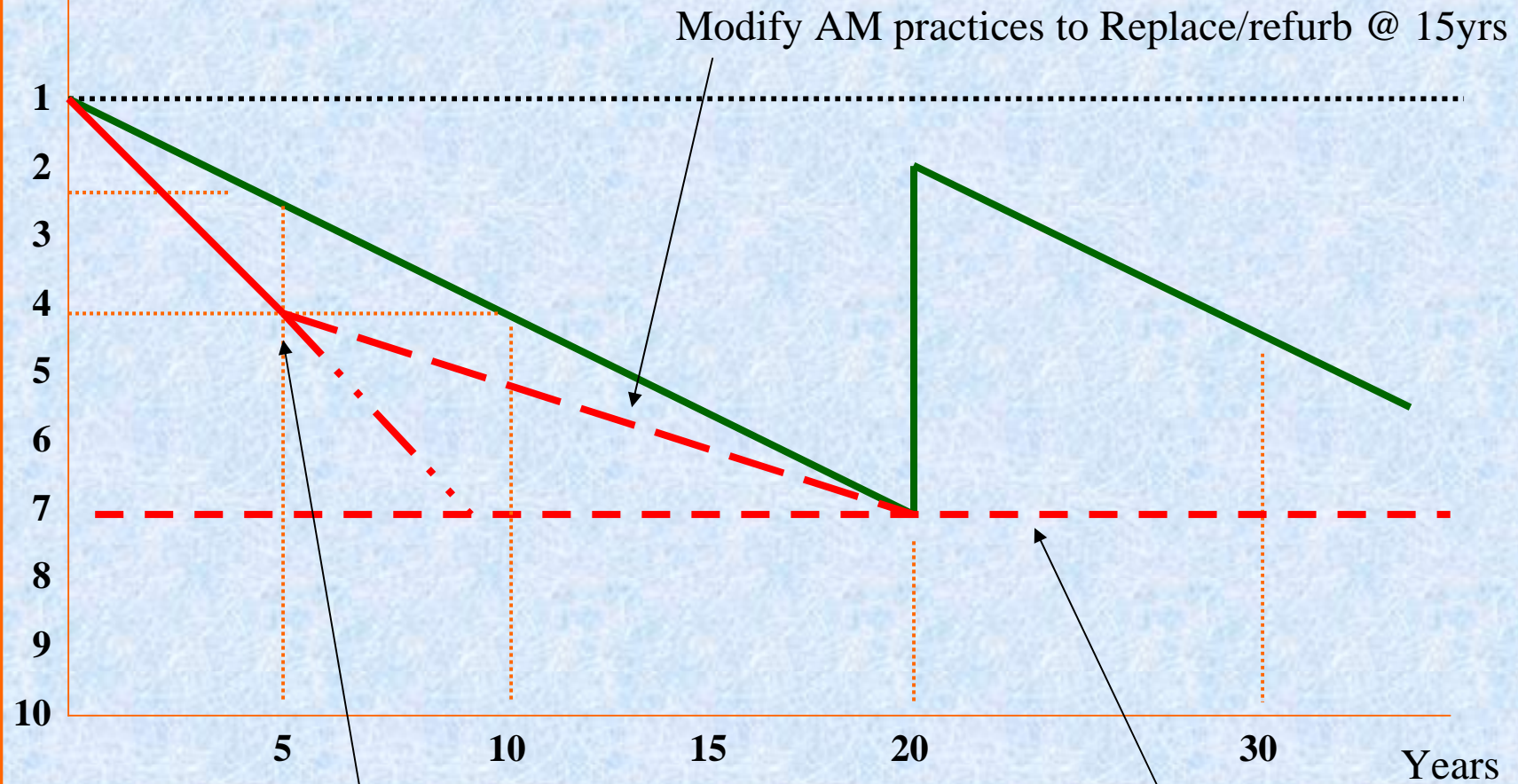


Condition Rating 2-3 @ 5yrs

Condition Rating 4-5 @ 10yrs



Condition Assessment

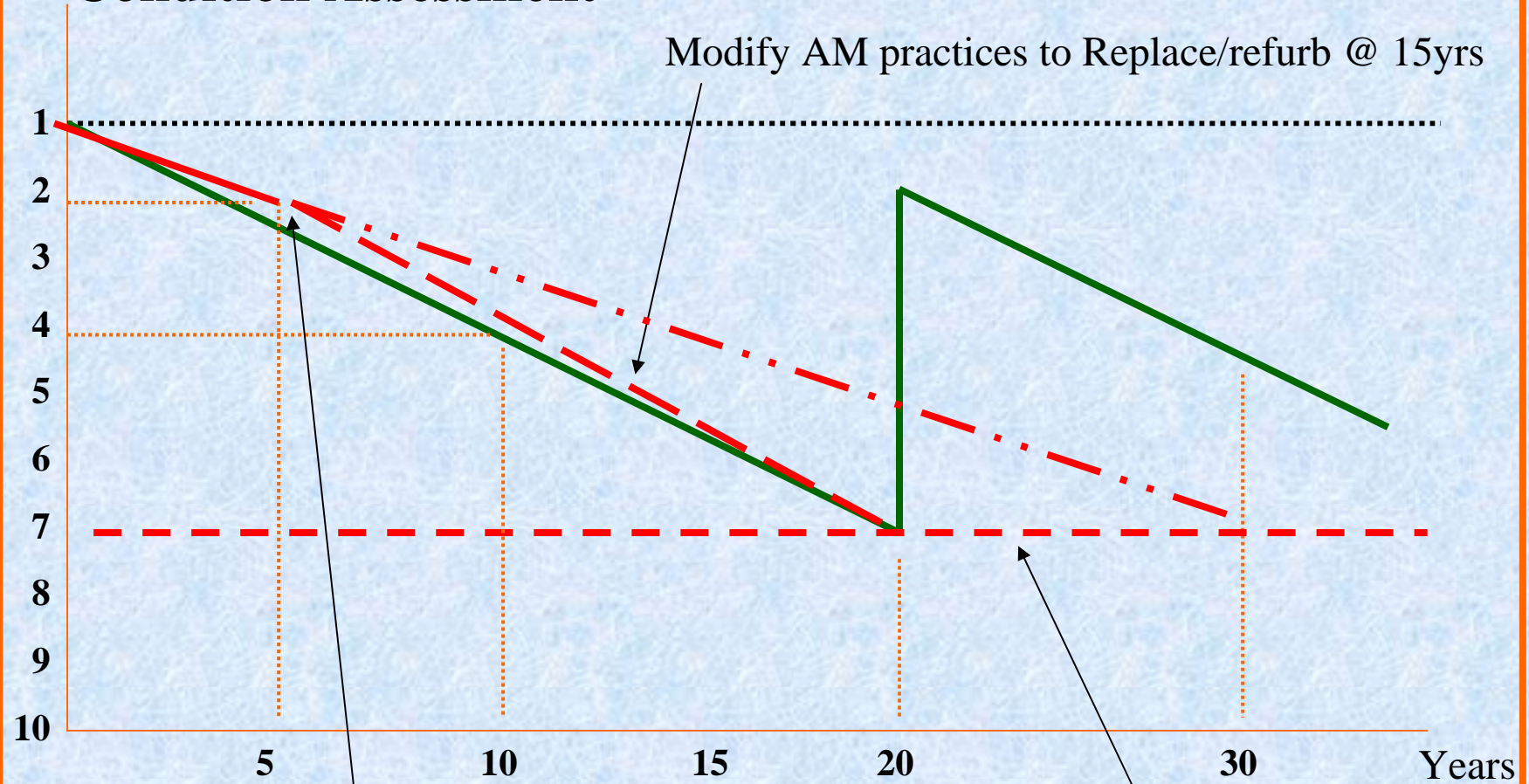


Condition Rating 4 not 2-3 @ 5yrs

Expect to Replace/refurb @ 9yrs



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



42

(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**

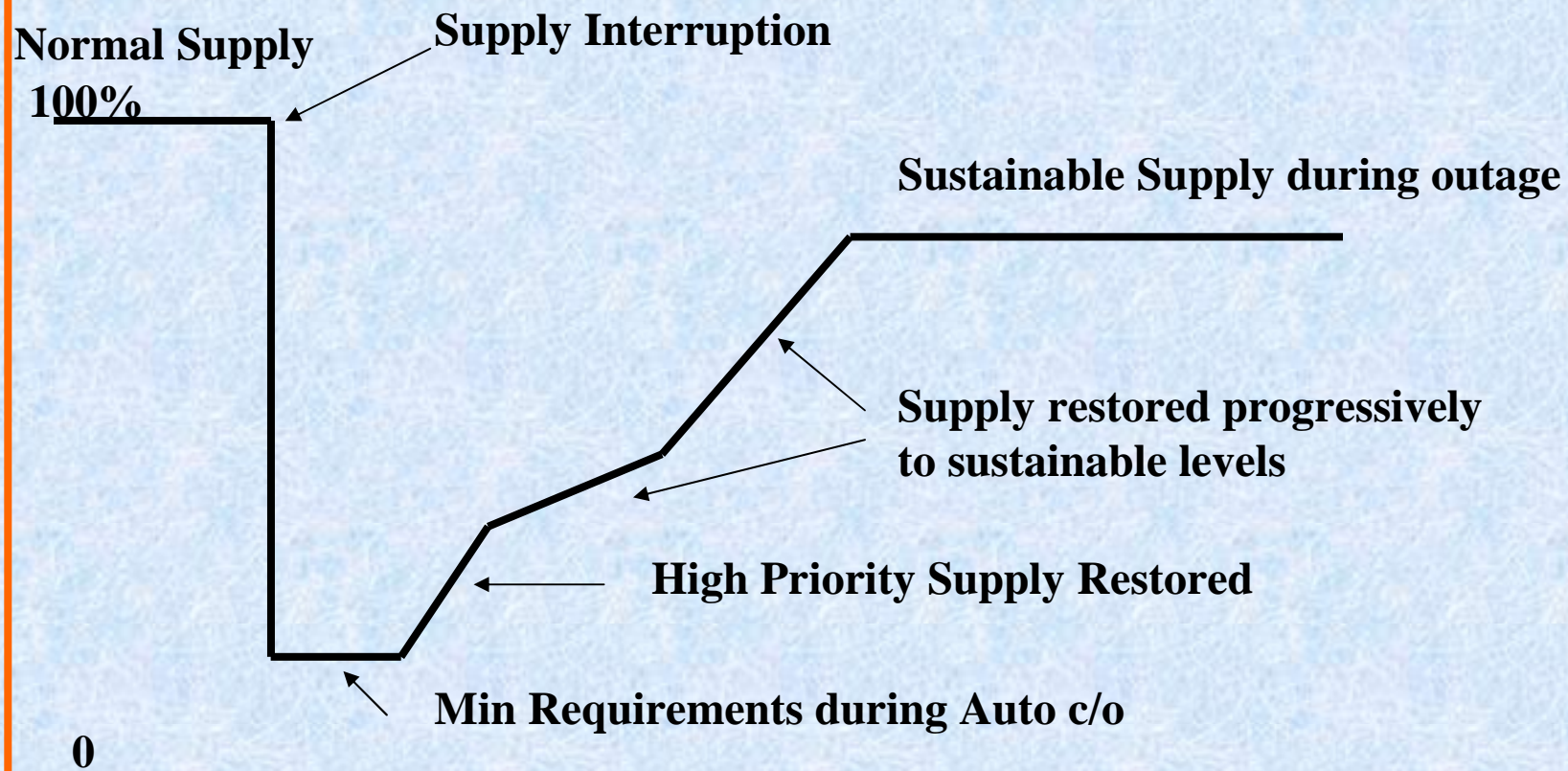


Business Continuity (Utilities) Plan

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:

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

Utilities

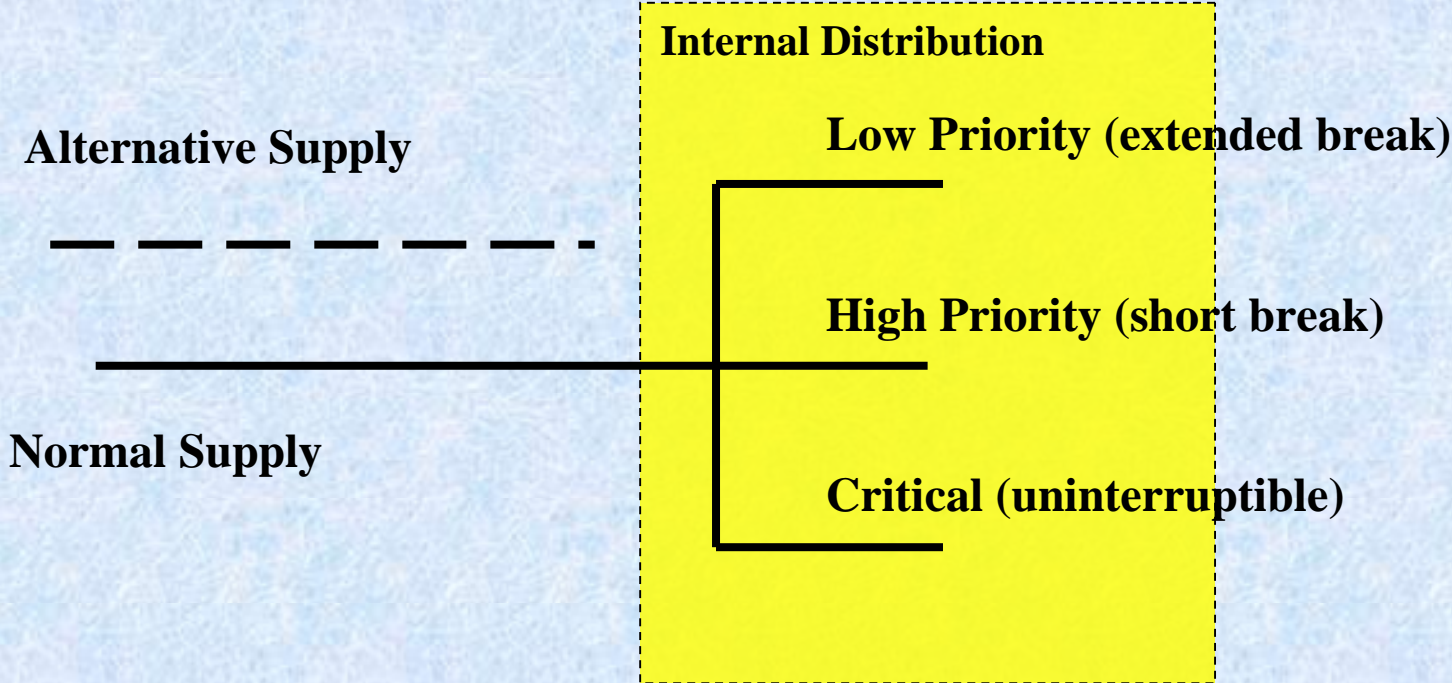
Electricity	Power & lighting, equipment, plant operation,
Water	Steam, sanitising, drinking/cooking, bathing, flushing, cleaning
Communications (External)	Voice & data, external
Gas	Steam-raising, heating, hot water, cooking
Sewer Drainage	Off-site discharge of (approved) wastes
Storm Water Drainage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



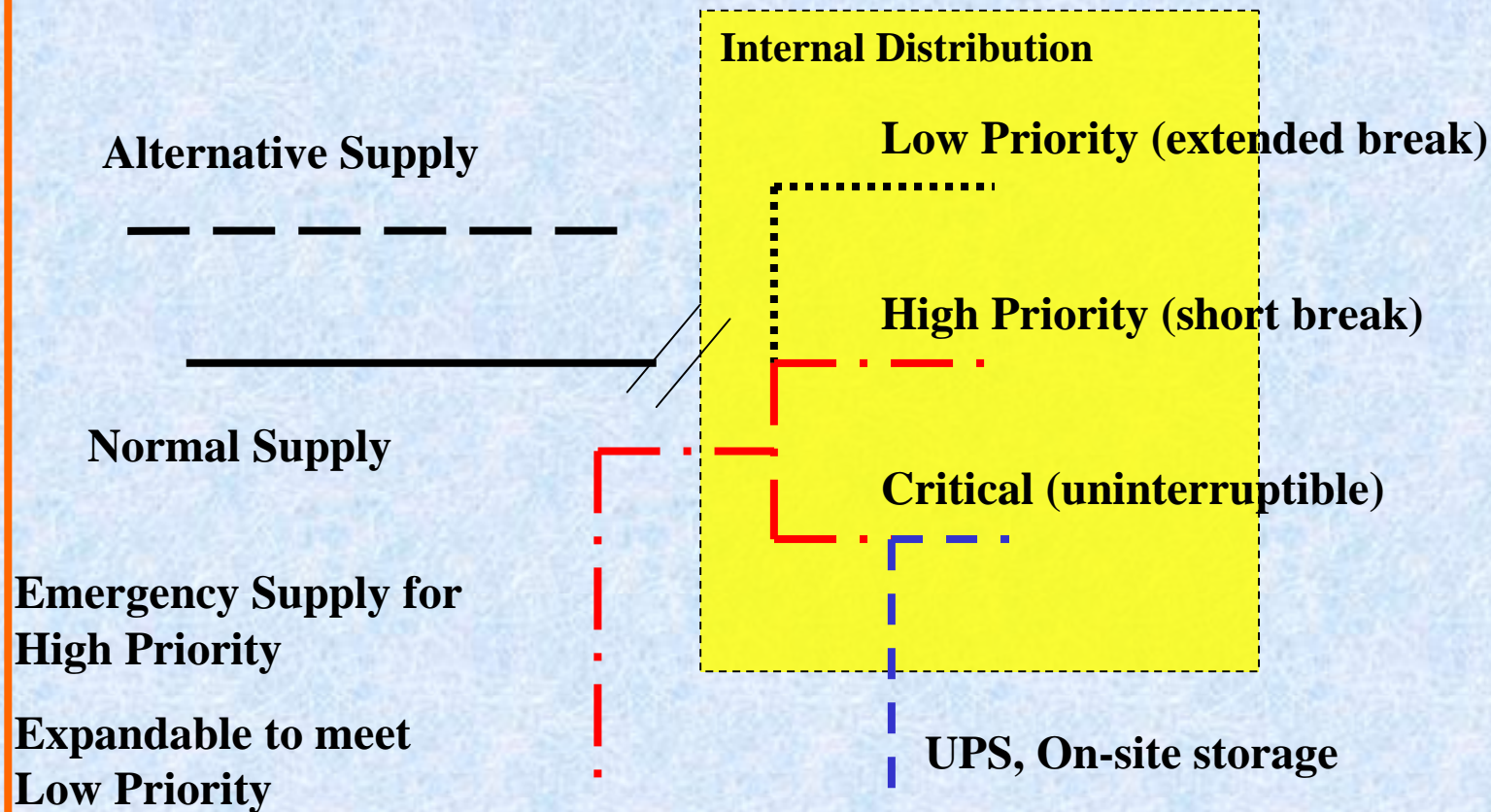
Key Engineering Services

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

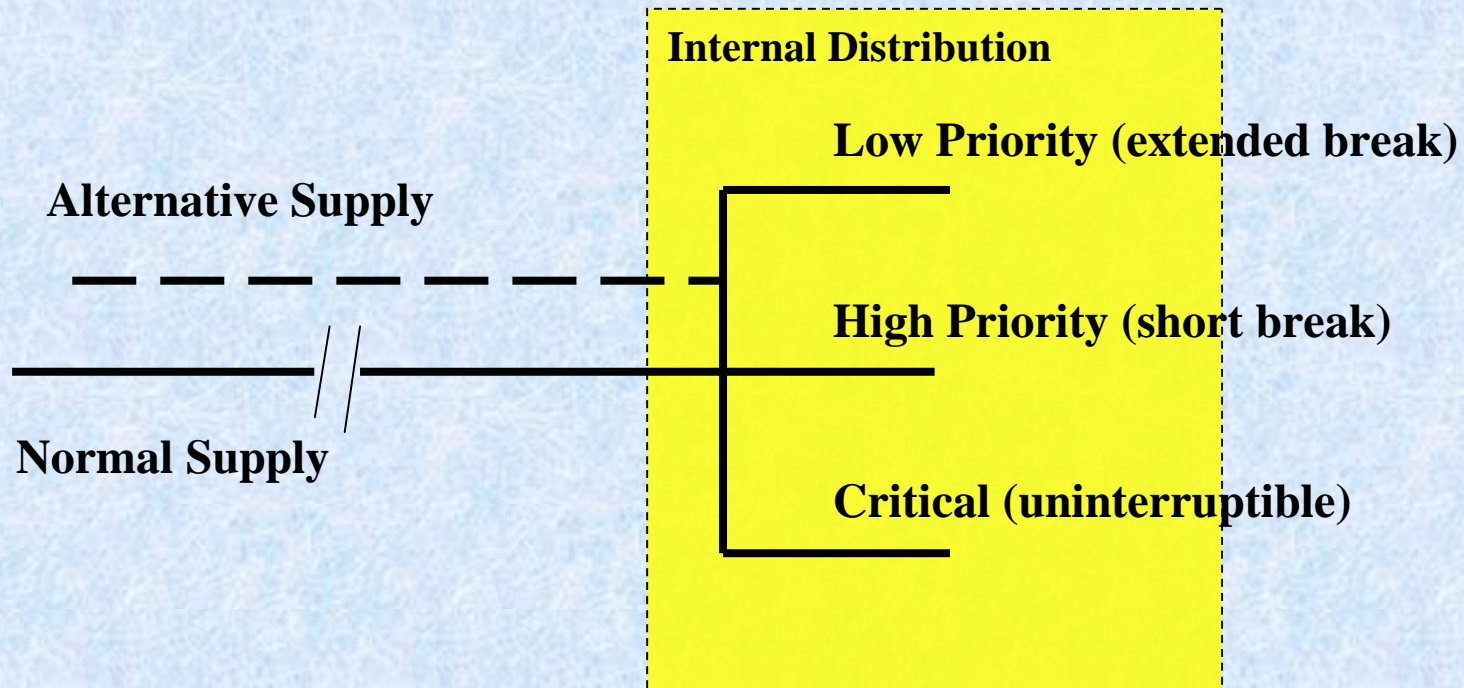
Utilities Schematic – Normal Supply



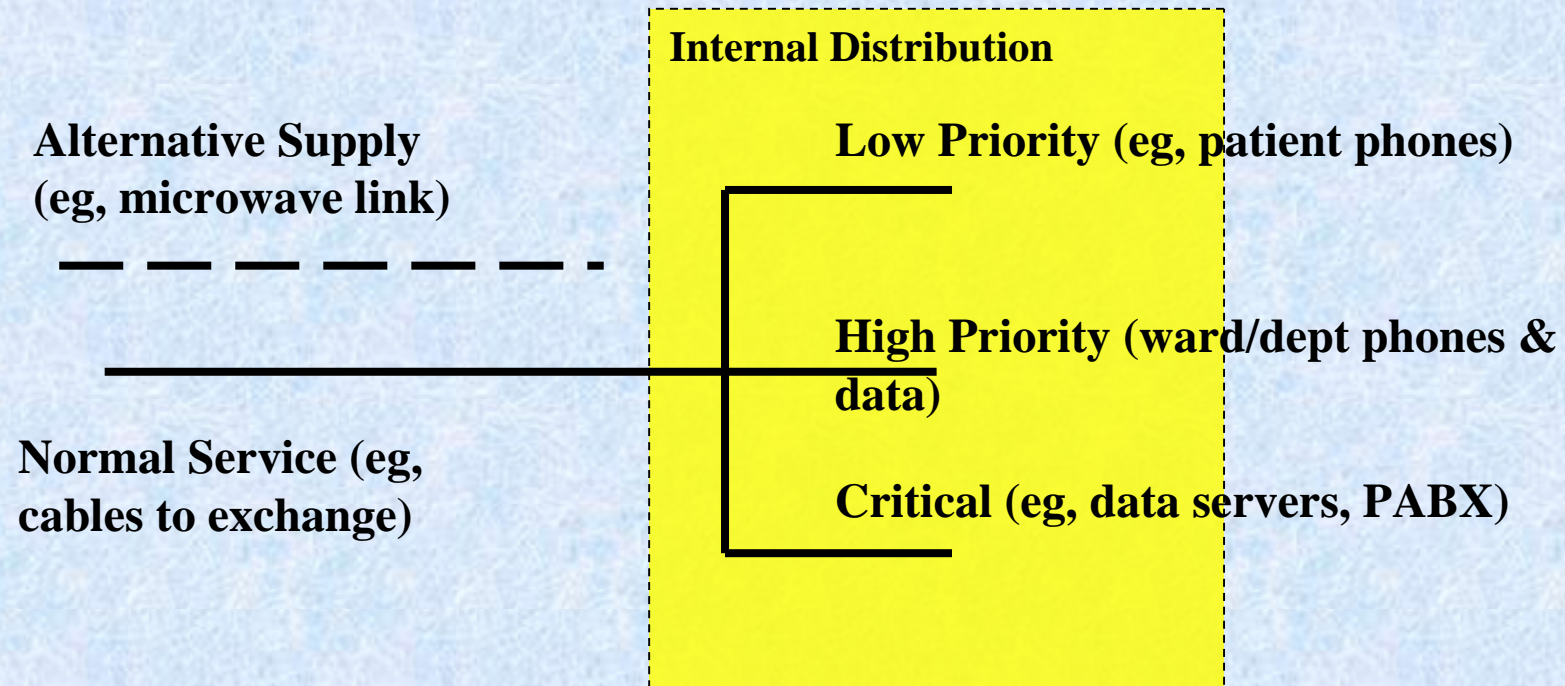
Utilities Schematic – **Emergency Supply**



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**