



# GREEN and CLEAN STANDARD FOR HOSPITALS

## MANAGEMENT SYSTEM REQUIREMENTS

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## FOREWORD

Looking at the popular mandate for aggressive economic reforms, Healthcare is an emerging sector that will simulate economy and contribute to employment generation. Over 40-million new jobs are expected to be generated by 2020 in healthcare. Over and above, healthcare industry assumes a significant role in social equalizing, as it employs a larger proportion of women workforce.

Environmentally sustainable hospital can help in lowering the cost of healthcare delivery. This happens as hospitals are encouraged to practice energy saving measures that include reducing the consumption of electricity, water, gases and other consumables, by adapting environmentally friendly processes, eliminating unnecessary purchases, choosing environment friendly agents/re-agents, recycling etc. All such aspects are addressed within this standard.

Cleanliness is an integral part of being Green and it plays key role in hospital safety through infection control. It is in this respect that, certain important aspects of cleanliness have been integrated with green concepts and the standard has so been named as "GREEN and CLEAN HOSPITAL". Green and Clean Standard for Health Care Organizations, is the first of its kind in Indian subcontinent.

This standard has been developed by the experts from Association of Healthcare Providers (India) (AHPI) and BUREAUVERITAS (BV). The standard covers all processes; clinical as well as non-clinical and requires, hospitals to undertake regular assessments for Green and Clean Management System.

Association of Healthcare Providers (India) represents a vast majority of Healthcare providers in India. It is registered under the Society registration ACT-1860 as a "not for profit" organization. It educates its members and at the same time, advocates with the government, regulatory bodies and other stake holders on issues, which have a bearing on enabling its member organizations to deliver safe and affordable healthcare services to the community at large. AHPI Institute of Healthcare Quality provides education support through certified training courses in the areas of Patient Safety, Clinical Governance/Audit, Standard Treatment Guidelines, Healthcare Quality, Infection Control, Lean/Green/Smart hospital etc.

A global leader for over 180 years in testing, inspection and certification, BUREAUVERITAS serves client needs around the world in the field of QHSE-SA-IS (Quality, Health, Safety, Environment and Social Accountability). As the world's leading 'Certification Service Provider", Bureau VERITAS Certification offers a comprehensive portfolio from ISO standards to customized schemes. Bureau VERITAS also has a vast experience in healthcare industry, which among others include; Development of "GREEN OT© STANDARD" for Operation Theatres, PDQ for various Pharmacy and various management systems for Hospitals.



## Introduction

Healthcare industry has two major challenges. One concerns safety and other are affordability. Safety comes through effective regulation and incentivizing quality, whereas affordability is achieved by improving efficiency through optimal use of resources and cutting down of waste processes.

The standard for GREEN and CLEAN Hospital is intended to be used by vast majority of hospitals and nursing homes to establish a robust framework to comply with requirements for being an eco-friendly organisation. It can be adapted by all categories of health care organisations (HCOs), engaged in delivery of primary, secondary or tertiary level of health services.

We are aware about how the environment influences human health through exposure to poor quality: air, water or land. Adverse impacts can come through physical, chemical or biological exposure. Hospital air quality and ventilation play important role in air concentration of pathogens which can result in adverse clinical outcomes. Many infections are acquired through physical contact and are result of improper hygiene or lack of cleanliness.

Hospitals function non-stop and in the process are known to generate huge amount of waste including infectious and hazardous waste. Hospitals consume plenty amount of water and electricity. They operate air handling units, leaving carbon footprint in many ways, affecting staff, patients and community at large. Hospitals use chemicals as cleaners, chemical sterilizers and as chemical reagents. Add to these are noise and radiation pollutions from variety of bio-medical equipment and radiological apparatus.

Hospitals generate one of the most diverse and difficult to manage waste streams as compared to other organization. They generate hazardous waste as well as bio-hazardous waste. The waste is generated in close proximity to human beings and poses a serious threat to the health of hospital staff, patients, their associates and even communities around. It is therefore important that hospitals manage the environment addressing these concerns.

Hospitals are increasingly being referred to as a place which causes stress amongst the patients and staff. The high grief exposure coupled with work pressure leads to higher stress among employees. Eco-friendly hospital by way of systematic interventions can provide a soothing environment to limit the stress and even medical errors.

Hospital is a place of healing. We shall ensure that it has a robust system in place, which mitigate the adverse effects of environment, within the hospital premises and at the same time does not in any way impacts external surroundings adversely. GREEN and CLEAN Hospital Standard provides necessary guidelines for effective environment, facilitating hospital in managing bio-medical waste and in controlling infection. This standard aims at optimum utilization of resources like electricity, water and other consumables, aiding hospitals in delivering safe and affordable healthcare to the community.

The GREEN and CLEAN Hospital aims to mitigate adverse effects of environment (GREEN) on patients and staff and even hasten the recovery process through infection free ambience (CLEAN). The compliance to this Standard shall provide tangible economic benefits like;



1. Reduced raw material/ resource use
2. Reduced energy consumption
3. Improved process efficiency
4. Reduced waste management and disposal cost
5. Utilisation of recoverable resource
6. Include use of renewable energy
7. Reduced hospital acquired infection and therefore reduced patient length of stay.

Hospitals shall develop Green and Clean Management System addressing the requirements of the standard and suitably incorporate the requirements within the existing hospital system. The five pillars identified in this Standard are:

- ▶ Leadership and Commitment
- ▶ Legal Compliance
- ▶ Environment Sustainability
- ▶ Operational Control
- ▶ Monitoring, Measurement and Improvement



## Glossary of Terms

### **Audit:**

A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements is implemented effectively and is suitable to achieve objectives.

### **Biomedical Waste:**

Any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of Biological, and including categories mentioned in Schedule I of Biomedical Waste Management Handling Rules 1998, MOEF, Govt. of India

### **Carbon Footprint:**

The total amount of greenhouse gases produced to directly and indirectly support human activities, usually expressed in equivalent tons of carbon dioxide (CO<sub>2</sub>).

### **Cleaning:**

The physical removal of external (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms). Cleaning physically removes rather than kills microorganisms. It is accomplished with water, detergents and mechanical action.

### **Environment:**

Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation

### **Environment of the Patient:**

The immediate space around a patient that may be in physical contact the patient and the health care provider when providing care. The patient environment includes equipment, medical devices, furniture (e.g., bed, chair and bedside table), telephone, privacy curtains, personal belongings (e.g., clothes, books) and the washroom facilities that the patient uses. It also includes Indoor air Quality, Illumination, Noise and ergonomics.

### **Hospital Clean:**

The measure of cleanliness routinely maintained in client/patient/resident care areas of the health care setting





## **Health care:**

Preventive and therapeutic health services in the workplace provided by trained occupational health professionals, e.g., nurses, hygienists, physicians.

## **Health and Safety:**

Health is the condition of the body & mind and the degree to which it is free from illness, or it is the state of being well. Safety is not being exposed to dangers or at risk.

## **Personal Protective Equipment (PPE):**

Clothing or equipment worn by employees of the hospital for protection against hazards.

## **Precautions:**

Interventions to reduce the risk of transmission of microorganisms (e.g., patient-to-patient, patient-to-staff, staff-to-patient, contact with the environment, contact with contaminated equipment).





## Pillars of Green and Clean Standard – Management System requirements

### PILLAR 1: LEADERSHIP AND COMMITMENT

#### 1.1 Management Responsibilities

The Hospital management shall plan and implement the Green & Clean practices within the hospital management system based on the requirements of this standard. The management shall provide evidence of its commitment by sustaining and improving effectiveness of Green & Clean management system by;

- a) Documenting the policy towards GREEN and CLEAN concepts and ensuring that it is communicated, implemented and understood at all levels and within all the functions of the hospital.
- b) Establishing objectives to realize Green and Clean Hospital Policies within all the functions and at all the levels as appropriate. The Objectives shall be
  - ▶ Consistent with Green and Clean policies
  - ▶ Communicated across all sections as appropriate
  - ▶ Measureable, analyzed and reviewed on regular basis
- c) Appointing a GREEN Representative (GR) who, irrespective of other responsibilities, shall have defined roles, responsibilities and authority towards implementing this standard
- d) Establish a GREEN & CLEAN team of staff from all departments to monitor progress towards environmental objectives
- e) Determination of applicable legislation, regulations and government notifications
- f) Conducting self-assessment at defined interval, to assess effectiveness of system
- g) Ensuring that patient safety aspects and risk management issues are identified as an integral part of Green and Clean program.
- h) Reviewing the performance of the system including the outcomes (such as reduction in energy and water consumption, amount of renewable energy used, rain water harvesting, re-use percentage, paper consumption, area of greenery increased, tree plantation etc.) of all the processes on regular basis and ensure timely corrective actions.
- i) Establishing a good building management plan in place.

**Note:** The plan shall include total cost of ownership approach strategies around Procurement, Reduction, Use- Phase Management, Responsible Reuse, and Responsible Recycling



- j) Establishing a documented procurement policy for environment friendly products and services
- Note:** A good purchase plan shall have a process for the project and plan for the most effective management of procurement with a consideration to its Life Cycle Perspective

## 1.2 Human Resource Management

The health care facility management shall determine the competency level of its personals based on appropriate levels of Education, experience and/or skills

- a) The Hospital shall have awareness/ sensitization programs for its Patients, Doctors, Nurses, Support staff, Cleaning Staff, New Joiners with reference to Green and Clean standard.
- b) The Hospital management shall have an education and training programme specific for operating staff, who are directly involved in implementing the standard by integrating Green and Clean concepts within their work processes.
- c) The training programs shall aim at building competencies for effective implementation, monitoring and improving of Green & Clean system.
- d) Management shall evaluate the effectiveness of such trainings

## 1.3 Infrastructure Management

The Hospital Management provide infrastructure and associated resources needed for the establishment, implementation, maintenance and continual improvement of the Green and Clean Management System. This among others shall include following;

- a. The Hospital shall have a strategy for selection of site of construction
- Note:** Hospital shall avoid development of inappropriate sites to reduce the environmental impact.
- b. The Hospital shall ensure conservation and preservation of available natural resources (water, energy, land, soil etc.) during construction and operation.
- c. The Hospital shall ensure that approved up-to-date plans are maintained with the site layout, floor plans, and fire escape routes
- d. The Hospital structure shall provide proper sidewalk, facility for public transport, parking for patient and staff as appropriate
- e. The Hospital shall have documented procedures for procurement, handling, storage, distribution usage and replacement of medical gases, vacuum and compressed air.
- f. The Hospital shall have plans for procurement of energy efficient equipment including air-conditioning, refrigeration and medical equipment like MRI, CT etc.



- g. The Hospital shall have a plan for calibration and preventive maintenance of its equipment and bio medical equipment as per the schedule.
- h. The hospital shall provide adequate infrastructure as appropriate for management of Bio Medical Waste.
- i. The Hospital shall ensure heating; ventilation and Air-conditioning (HVAC) systems are maintained and operated by trained staff as per the schedule, so as to achieve optimum operating efficiency.

**Note:** Roof of hospital may be provided with surface insulation to improve efficiency of HVAC

#### 1.4 Facility Management

Management shall have a documented processes and criteria for maintenance and management of facility. The Hospital shall provide and maintain appropriate work environment which are necessary for operation of its processes and can affect the health care of patient, staff safety and productivity. Suitable environment can be a combination of human and physical factors, such as, (i) Psychological (e.g. stress-reducing, burnout prevention, emotionally protective) and (ii) Physical (e.g. temperature, heat, humidity, light, airflow, hygiene, noise).

- a) The Hospital shall plan for optimal natural light in general and patient wards in particular.  
**Note:** Besides savings, the natural light is known to accelerate healing process
- b) The Hospital shall ensure contamination detection, monitoring and its prevention within the facility
- c) The Hospital shall ensure that it establishes criteria for evaluation and acceptance of the environment friendly material usage for the facility.
- d) The Hospital shall ensure that required scavenging systems are installed for keeping the facility safe.

**Note:** Scavenging system is the collection and subsequent removal of waste anaesthetic gases. Anaesthesia Gas Scavenging System (AGSS) shall be installed in all areas where anaesthetic agents are being used

- e) The Hospital shall establish and maintain procedure for cleaning including protocols and criteria for cleaning processes for the entire building and all the areas in the hospital especially areas like toilets, lifts, storage areas, pharmacies, kitchen, maintenance yard, roof top etc.
- f) Hospital shall ensure that the facility is inspected periodically for cleaning, leakage / seepages, cracks etc. and landscape / vegetation of outdoor environment is maintained all the time
- g) The hospital shall ensure that decorative paint used on walls, doors and other surfaces is free of added lead.



## PILLAR 2 – LEGAL COMPLIANCE

The Hospital shall establish, implement and maintain the processes needed to evaluate fulfilment of its compliance obligations.

### 2.1 Determination of Legal and other statutory requirements

- a) The Hospital shall establish and maintain a procedure to identify all the applicable legal requirements and other statutory/regulatory requirements to which the organization need to subscribes.
- b) The Hospital shall establish and maintain procedure to incorporate all the applicable statutory and regulatory requirements including norms of local statutory bodies, towards Green and Clean policies, within the hospital management system.
- c) The Hospital shall adhere to statutory norms to ensure facility, patient and staff safety in all areas

**Note:** Objective of facility safety is to provide employees with a safe and healthy workplace. A safe work environment ensures continued productivity by minimizing lost work days and work restrictions due to injuries

- d) The Hospital shall obtain and maintain consents and/or authorisation, from the State Pollution Control Board for compliances as appropriate.
- e) The organization shall retain documented information as evidence of the compliance evaluation result(s).

### 2.2 Biomedical Waste Management (BWM)

- a) The Hospital shall comply with biomedical waste management rules.

**Note:** Hospital shall ensure that biological waste shall be disposed as specified under the BWM BMW rules as appropriate. Biomedical waste must be properly managed and disposed of to protect the environment, general public and workers, especially healthcare and sanitation workers who are at risk of exposure to biomedical waste as occupational hazards

**Note:** A matrix can be designed for all stakeholders.

- b) The Hospital shall have clear defined roles and responsibilities of all staff members towards compliance of BWM.
- c) The Hospital shall have an educational program for new and existing employees regarding its waste management plan.

**Note:** Hospital shall conduct orientation classes on biomedical waste management for staff members as appropriate



- d) The Hospital shall have a process to review and improve the waste management plan preferably through a committee consisting of all stake holders.
- e) The Hospital shall have a process for Segregation, collection, reception, storage, transportation, treatment, disposal and handling of all kinds of waste in any form. The Biomedical Waste shall be labelled appropriately (refer Sch IV of BMW Rules) and segregated in colour code containers (refer Sch. 1 of BMW Rules) which shall be fit for use as per BMW rules.

**Note:** Hospital shall have a waste management plan for all waste including recyclable, hazardous, bio medical and e -waste and materials. Waste may be collected & segregated through coloured bins for optimum resource recovery. Waste shall be tracked along with a reporting mechanism for its weight or volume and associated cost information.

- f) Hospital's waste management plan shall have documented procedures to prevent contamination of the land associated with inadequate disposal of toxic, hazardous, infectious or radiological substances.

**Note:** Hospital shall make efforts to prevent land pollution. Land pollution is defined as any physical or chemical alteration to land which cause its use to change and render it incapable of benefits thereon

- g) The Hospital shall have a defined process to select contractors for solid, medical or hazardous waste treatment and shall ensure periodic review

**Note:** Hospital shall verify selected contractors who are licensed and permitted by the state regulatory body (ies)

- h) Pharmaceutical Waste:

- ▶ The Hospital shall have policy on free medicine sample for patients
- ▶ The Hospital shall have system in place for Informing and educating consumers about safe disposal methods for unused or expired medications
- ▶ The Hospital shall, wherever possible, establish contracts that ensure the return of excess pharmaceuticals to the manufacturer
- ▶ The Hospital shall ensure that pharmaceutical waste is treated and disposed of in accordance with national and/or WHO guidelines as appropriate
- ▶ All discarded/expired medicines shall be either sent back to manufacturer or disposed by incineration as per BMW rules.
- ▶ The Hospital shall Initiate and communicate take-back programs to provide and alternative for patients for disposing of unused medicines down the drain or in municipal waste



## PILLAR-3 ENVIRONMENT SUSTAINABILITY

The hospital shall develop sustainability indicators such as Water, Energy and Carbon by establishing processes in selection, procurement, use, maintenance and disposal of infrastructure and facilities. Typical indicators are as follows:

### 3.1 Water Footprint

Water is one of the precious resources. It needs to be conserved. The hospital can conserve water resources by closely monitoring water usage. Water conservation shall encompass the policies, strategies and activities to (i) manage fresh water as a sustainable resource, (ii) to protect the water environment, and (iii) to meet current and future human demand.

- a) The Hospital shall have a plan and strategy for conservation and recycling of water. This may, include waste water treatment plant, use of rainwater for various applications (including rain-harvesting) etc.

**Note:** Water recycling is, reusing treated wastewater for beneficial purposes such as landscape irrigation, toilet flushing, and replenishing ground water basin.

- b) Hospital shall have an alternate source of water available at the facility
- c) The Hospital shall have a plan for water usage for the whole facility (landscape and building) which includes measurement and reduction on continual basis. Water meters shall be installed at different locations to measure the consumption.
- d) Hospital shall adopt various means to reduce water consumption like, installing water- efficient fixtures and technologies, growing drought-resistant landscape.
- e) The Hospital shall have a plan for installing an adequate sewage treatment system where treated effluents can be used for gardening.

**Note:** Effluent treatment plant shall remove biological or chemical waste products from water, thereby permitting the treated water to be used for other purposes

**Note:** Blood and body fluids coming from clinical labs & OT in drainage needs to be segregated for treatment before it is discharged into main STP plant

- f) Avoid bottled water when safe alternatives exist
- g) Hospital shall have an on-going educational program for efficient usage and conservation of water for all stakeholders (staff, patient and visitors)

**Note:** Education content shall be prepared for all faculty and staff. Booklets, brochures and boards can be used for Information Education and Communication (IEC) for public





- h) Hospital shall have a plan for usage of potable water including its periodic monitoring as appropriate.

**Note:** Typical parameters can be evaluated are; colour, turbidity, pH and the organoleptic (aesthetic) parameters (taste and odour) along with coliform counts.

### 3.2 Energy Footprint

- a) The hospital shall monitor and measure the energy consumption and constantly work towards its reduction/conservation.

**Note:** Energy conservation refers to reducing energy consumption through using less of an energy service. For example hospital may progressively adopt automated system like photocell, which measures day/natural light and switch-on/ switch-off electrical lights.

- b) The Hospital shall have a plan for installation of energy efficient equipment and devices as appropriate (ref 4.2.2-f)

- c) The hospital shall plan for high efficiency and energy saving (LED) lighting in outdoor and indoor applications.

- d) The Hospital shall develop a plan for usage of renewable energy sources (solar, wind, bio-mass)

- e) Hospital shall ensure energy audits of the building at periodic intervals. Hospital shall install meters for different functional areas to monitor/measure energy consumption.

**Note:** An energy audit is an inspection, survey and analysis of energy flows for energy conservation in a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s).

- f) Hospital shall have a plan for refrigerant management so that it does not impact the environment.

**Note:** Refrigerant management plan includes existence of practices that maximize recovery and recycling of ozone-depleting substances (both chlorofluorocarbons [CFCs] and hydro chlorofluorocarbons [HCFCs] and their blends) during the servicing and disposal of air-conditioning and refrigeration equipment. Hospital shall ensure phasing out of the ODS (Ozone depleting substances) as refrigerant

**Note:** Hospital can have heat pumps installed to utilize energy coming out of HVAC system. Hospital can install heat drums or such devices to save energy if 100% fresh air systems are being used for HVAC.

- g) Hospital shall have an on-going educational program on conservation of energy resources for staff, patient and / or family member



### 3.3 Carbon Footprint

- a) The Hospital shall plan for optimal usage of natural ventilation, natural day light, water use with sensor taps as appropriate
- b) The Hospital shall ensure procurement of environmentally friendly products with minimal packaging and shall contract eco-friendly services
- c) The Hospital shall develop and monitor plans to reduce the carbon emissions from hospital owned vehicles and contractual vehicles under control or influence of organisation.
- d) The hospital shall develop programs to reduce waste
- e) The Hospital shall have documented policy and plan for recycling of waste including bottles, plastics, papers etc.
- f) The hospital shall Plant trees in areas available inside/outside the premises as appropriate.
- g) Up-gradation of lightning retrofits with CFL or LED and replacing conventional chokes by electronic chokes.
- h) Utilization of DG-set as back-up should be limited to emergency and essential loads of hospital and important support services
- i) The hospital can hand over used engine oil to authorised vendor for recycling
- j) Usage of Solar water heater instead of electric heaters for hot water for hospital day use as appropriate.

## PILLAR 4 – OPERATIONAL CONTROL

The Hospital shall establish, implement, control and maintain the operational processes needed to meet Green and Clean Management system requirements.

### 4.1 Hospital Infection Control

- a) The Hospital shall have a well-designed, comprehensive and coordinated Hospital Infection Prevention and Control (HIC) programme as part of green and clean compliances, aimed at reducing risk to patients, visitors and care providers.
- b) The Hospital shall ensure policies and procedure for sterilization activities are documented and implemented
- c) The Hospital shall take actions to prevent and control healthcare associated infection (HAI) in patients
- d) The hospital shall ensure the preventive controls of possible infection carriers like hospital staff including medics and paramedics by vaccinating them against diseases as appropriate.



- e) Hospitals shall establish and implement sterilisation program for its sensitive zones and for surgical equipment and Instruments.
- f) The Hospital shall conduct surveillance activities to monitor and measure HAI.
- g) The Hospital shall use materials which help in toxic waste reduction
- h) The Hospital shall progressively eliminate usage of mercury, lead and carcinogenic items. Hospital shall organise for re-cycling of xylene used in histopathology lab through authorised vendor to prevent contamination of eco system.
- i) The Hospital shall have a process for indoor and outdoor environment management:
  - ▶ The Hospital shall demonstrate initiative by maintaining good indoor and outdoor environment as appropriate

**Note:** Hospital shall have walkways, greenery, landscaping, waste management, environment friendly transport etc.

  - ▶ The Hospital shall have a plan for maintaining good indoor air quality, lighting and ventilation
  - ▶ The Hospital shall ensure use of low emitting materials used in the facility.

**Note:** Usage of material that contain none or reduced amounts of persistent bio accumulative and toxic chemicals (PBTs), Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), Halogenated Fire Retardants (HFR), Heavy Metals phthalates, Perfluorochemicals (PFCs) and other chemicals that can cause harm to installers, staff, patients and visitors.

  - ▶ The Hospital shall have a policy for labelling and storing all chemicals as per manufacturers' recommendations
  - ▶ The Hospital shall have no smoking policy to ensure tobacco free zone
- j) The Hospital shall establish a process for housekeeping and cleaning agents with defined criteria:
  - ▶ The Hospital shall have housekeeping and cleaning policies and procedures in accordance with the size and complexity of the services and shall be aligned with green hospital standards.
  - ▶ Hospital shall have defined criteria for selection of housekeeping products.
  - ▶ The Hospital shall have an on-going induction training programme for all the housekeeping staff for the cleaning of all the areas in the hospital.



## 4.2 Sanitization Process

The Hospital shall ensure adequate resources towards sanitization services which include:

- a) Assigning with overall responsibility for the sanitization services of the hospital
- b) Identifying and deploying adequate human resources with assigned responsibility for undertaking timely cleaning and disinfection work for specific areas
- c) Supervision of cleaning staff by those who are trained and knowledgeable in cleaning standards and practices
- d) Written procedures for cleaning and disinfection of patient care areas and other areas
- e) Provision for additional cleaning capacity during any exigency that does not compromise other routine patient care cleaning
- f) Continual education of sanitation staff.
- g) Monitoring of environmental cleanliness and reporting of results
- h) Establishing and implementing pest control processes

## 4.3 Food and Hygiene practices

The Hospital shall have a process for food purchasing that supports human and ecological health:

- a) The Hospital shall have sustainable food purchasing policies and procedure.

**Note:** A sustainable food purchasing policy shall enable the institution to move from isolated projects, sustained by the interest and involvement of a few people, to an institutional framework for understanding and making change towards a more sustainable food system

**Note:** Hospital may prefer contracting with local suppliers that rely on locally grown produce. This will minimise energy consumption, otherwise required on refrigeration etc.

- b) The Hospital shall have a policy for food service-ware which shall also be environmentally preferable material

**Note:** Selection of environment friendly food service ware shall ensure use of less energy and generates much lower levels of air and water pollutants. It also ensures less solid waste in its production, use and disposal

- c) The Hospital shall develop and implement a purchasing programme for non-food service ware.

**Note:** All paper-based items - napkins, paper towels, wipes, tray liners etc. shall be procured such that they fulfil environmentally preferred material criteria in line with clause 1.1 (i).

- d) The Hospital shall develop and implement a food waste reduction programme.



**Note:** A food waste reduction programme shall encourage businesses to contribute to a more sustainable economy by building waste reduction into design and delivery new and improved products and services. Hospital can have donation programme for usable food

- e) The Hospital shall facilitate recycling of food

**Note:** Recycling of food shall reduce solid waste disposal in landfills. It can also save a lot of money and cause less impact on the environment

- f) The Hospital shall minimize chemical use in food services preparation and service areas, including cleaning chemicals and pest management.

**Note:** Hospital shall use environmentally preferable cleaning products to clean food preparation and food service areas (cafeterias), kitchen equipment, surfaces and dishware

- g) The Hospital shall have a process for evaluation of the suppliers, which fulfils environmental impact material criteria.

**Note:** Environmental impact materials are the unwanted by-products of economic activities which alter environmental conditions such as the acidity of soils, the nutrient content of surface water and the radiation balance of the atmosphere

- h) The Hospital shall have an educational programme for patient and staff to encourage consumption of food that support human and ecological health.

**Note:** Hospital shall use signage, educational posters and awareness sessions about food that support human and ecological health

#### 4.4 Health and Safety

- a) The Hospital management shall ensure that Health and Safety related hazard identification and risk assessment (HIRA) and Environment related aspect impact analysis are being carried out for their processes and services utilised

- b) The Hospital shall ensure policies and procedures for the evaluation of staff (employees or contract workers) who are, or may be, exposed to blood or body fluids and other infectious hazards that include:

- ▶ A sharp injury prevention program for which hospital shall have pre-exposure prophylaxis programme e.g. Hepatitis B vaccination, measurement of titers, anti- tetanus and typhoid vaccination to the appropriate employees
- ▶ Establishing control plan for protecting Immune System of staff who is exposed to immunosuppressant drugs administration and those handling body fluids contaminated with immune depressing vectors.
- ▶ Timely post-exposure follow-up when indicated



- ▶ A respiratory protection program if staffs are entering an airborne infection isolation room and a mechanism for following staff that have been exposed to tuberculosis review.
  - ▶ Reporting of exposures to appropriate authorities.
  - ▶ Pre-exposure and post-exposure prophylaxis should be adhered as per the national norms
- c) Personal Protective Equipment (PPE) shall be supplied and used within the hospital whenever there are risks to health and safety that cannot be adequately controlled in any other way or. PPE shall be:
- ▶ Properly assessed before use to ensure that it is suitable;
  - ▶ Maintained and stored properly;
  - ▶ Provided with instructions on how to use it safely;

**Note:** PPE, may be defined as all equipment, including clothing affording protection against the weather, which is intended to be worn or held by a person at work and which protects him/her against one or more risks to his/her health and safety

## PILLAR 5 – MONITORING, MEASUREMENT AND IMPROVEMENT

Purpose of any management system is that the organization has transparent, objective and dynamic way of working. It is therefore necessary that such a system has formal means of monitoring, measurement and review so that non-conformities are identified and corrective action taken to keep system improving on continuous basis.

### 5.1 Monitoring, Measurement of operational and legal compliances

The Hospital Management shall establish, implement and maintain a procedure(s) to monitor and measure its performance related to compliance to this Standard, on a regular basis. The procedure(s) shall provide for qualitative and quantitative measures, as appropriate:

- a) Monitoring of the extent to which the Hospital's management system 'Objectives' related to Green and Clean policies are met.
- b) Shall have plan and monitoring mechanism during construction to reduce noise pollution, air pollution, soil erosion and airborne dust generation.
- c) Hospital shall have indicators to monitor and measure & optimize usage of energy and water.
- d) Hospital shall have indicators to measure the waste generation as per the category (hazardous, recyclable, bio medical, e-waste etc.).
- e) Hospital shall periodically monitor the Hygiene, work environmental conditions, Infections Controls, and Health and Safety Performance of the processes.
- f) Hospital shall evaluate its compliance to applicable Environmental, Health & Safety Laws and regulations periodically.



## 5.2 Green and Clean Improvement Programs

- a) The Hospital Management shall promote green practices to the stakeholders
- b) The Hospital shall promote among the clinicians about sustainable healthcare delivery using Green and Clean practices in Operation Theatres, ICU's, and Medical Laboratories etc.
- c) A hospital shall have reporting system for all sentinel events/incidents related to all aspects covered in this standard and take corrective actions as appropriate
- d) The Hospital shall undertake continual quality improvement programs (CQI) through a cross discipline approach aimed at usage of new technique/methods, new materials, which can help in minimising environmental impact in every process within the hospital and beyond.
- e) The Hospital shall anticipate and/or respond as appropriate to prevent or mitigate the associated risks arising out form internal or external emergency situations.
- f) The hospital shall incentivise environment friendly initiatives by their staff

## 5.3 Internal audits

The Hospital shall conduct internal audits through trained personnel at planned intervals to provide information on whether the Green and Clean Management System;

- a) Conforms to the requirements of this standard.
- b) Is effectively implemented, maintained and improving.

The Hospital shall record the Audit results and take action on the audit findings for improvements.

## 5.4 Management Review

Top management shall review the organization's Green and Clean management system at planned intervals to ensure its continuing suitability, adequacy and effectiveness.

The management review shall include consideration of:

- a) The status of actions from previous management reviews;
- b) Statutory & Regulatory compliances
- c) Risk Assessment and Management
- d) Inputs receive by way of suggestions and feedbacks from Internal and External sources in relation to issues related to green and clean compliances
- e) Adequacy of Green and Clean Policy
- f) The extent to which Green and Clean objectives have been achieved



- g) Assessing adequacy of resources
- h) Information on the organization’s Green and Clean performance, including trends in:
  - 1) Nonconformities and corrective actions
  - 2) Monitoring and measurement results (Ref 5.1)
  - 3) Opportunities for continual improvement. (Ref 5.2)
  - 4) Internal audit results (Ref 5.3)

Records of Management Review shall be maintained.

## V- CERTIFICATION PROCESS

### 1. Assessment Tool

The Hospital shall perform effectively and efficiently a Self-assessment to achieve “Green and Clean Practices” status by:

- ▶ Understanding and satisfying the requirements of the Green and Clean Practices
- ▶ Monitoring the changes in hospital environment
- ▶ Defining and deploying strategies towards making Green and Clean Hospital
- ▶ Managing all required processes and relevant resources efficiently and effectively
- ▶ Demonstrating confidence in its employees, leading to increased motivation, commitment and involvement

This assessment tool uses three maturity levels. The hospital shall review its performance against specified criteria to identify current maturity levels and determine its strength and weaknesses. The typical sample of assessment tool matrix is as follows:

	<b>NA</b>	<b>Level 1 / Rating 1</b>	<b>Level 2 / Rating 2</b>	<b>Level 3 / Rating 3</b>	<b>Remarks</b>
Elements of Green and Clean Hospital	Not applicable	Requirements <b>not defined not implemented</b>	Requirements <b>implemented</b> but <b>not defined</b>	Requirements <b>defined</b> and <b>implemented</b>	
E-1					
E-2					



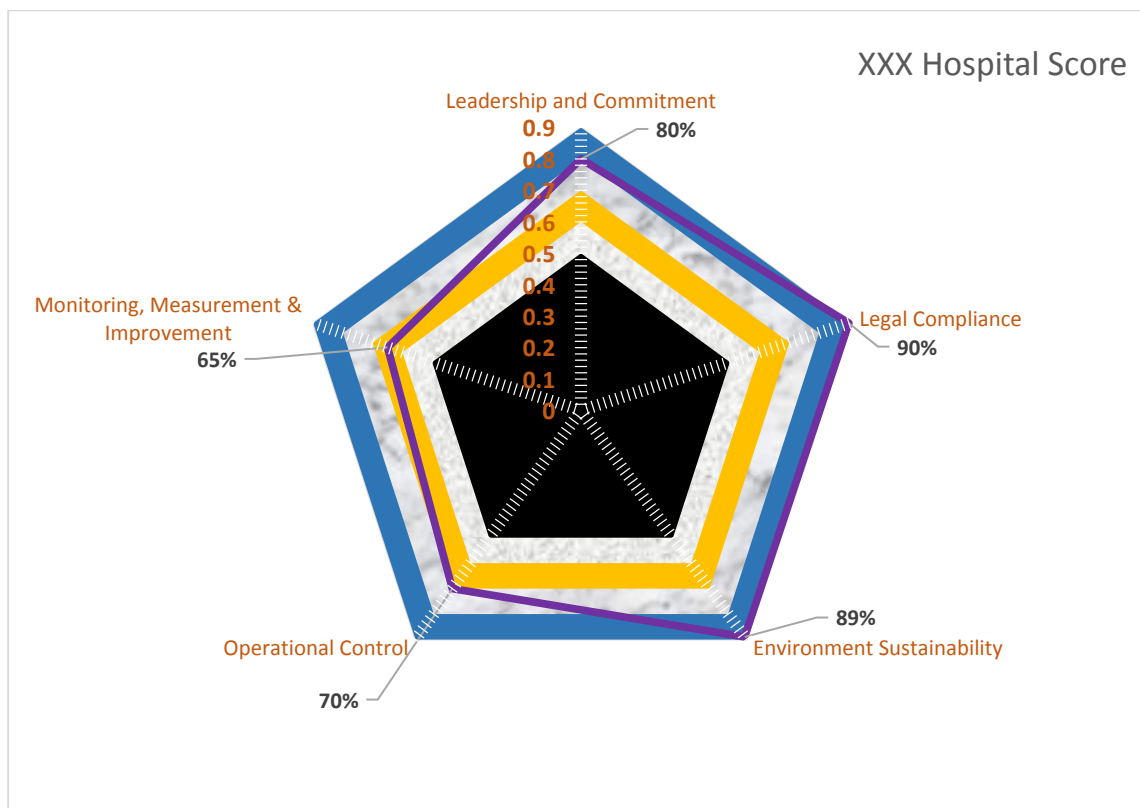


## 2. Rating Scale

Based on the conditions defined in above assessment tool the percentage of maturity will be calculated. Based on the calculations of the percentage (Qualifying score), Hospital's "Green and Clean" Status shall be confirmed.

Assessment Tool Criteria	Platinum Category	Diamond Category	Gold Category	Silver Category
A. Leadership & Commitment	$\geq 90\%$	$\geq 80\% - < 90\%$	$\geq 70\% - < 80\%$	$\geq 60\% - < 70\%$
B. Legal Compliance	$\geq 90\%$	$\geq 80\% - < 90\%$	$\geq 70\% - < 80\%$	$\geq 60\% - < 70\%$
C. Environment Sustainability	$\geq 90\%$	$\geq 80\% - < 90\%$	$\geq 70\% - < 80\%$	$\geq 60\% - < 70\%$
D. Operational Control	$\geq 90\%$	$\geq 80\% - < 90\%$	$\geq 70\% - < 80\%$	$\geq 60\% - < 70\%$
E. Monitoring, Measurement and Improvement	$\geq 90\%$	$\geq 80\% - < 90\%$	$\geq 70\% - < 80\%$	$\geq 60\% - < 70\%$
Range	$\geq 90\%$	$\geq 80\% - < 90\%$	$\geq 70\% - < 80\%$	$\geq 60\% - < 70\%$
NOTE :	(1) In order to be eligible for a particular category, apart from the overall score, there should be no criteria with Rating 1. (2) An overall score of $< 60\%$ would not be considered eligible for certification			

Based on the assessment, the results will be published in the form of radar chart as given in the next figure.



Hospital may use this tool for their internal assessment to identify the maturity level of Green and Clean Standards with the use of Self-Assessment Questionnaire (SAQ)

### 3. Conditions for Certificate Issuance

The certificate shall be issued to the Hospital once all the criteria comply with the scoring requirements. A score of  $\geq 60\%$  and a rating of 2 and above in all of the criteria will only entitle hospital to get the certificate as per the category stated above (Refer Section 2 above). The validity of the certificate will be for 3 years with one mid-term review after 18 months. Inability to perform the mid-term review within a tolerance of +3 month (max) shall result in suspension of the certificate.

### 4. Recertification Audit

A recertification audit shall be planned and conducted at the end of the current certificate validity to evaluate the continued fulfillment of all the requirements of the Green and Clean management system standard. The recertification audit shall be planned and conducted within three months prior to the current certificate expiry date to enable for timely renewal of the certificate before the end of validity of the current certificate to maintain continuity of the certification status. The renewed certificate shall be issued subject to Green and Clean score requirements are complied with in a similar approach as followed for the initial certification.



## 5. Self-assessment

Self-assessment is a comprehensive and systematic review by the hospital about its activities and performance in relation to the degree of maturity with respect to Green and Clean Hospital Standard.

Self-assessment shall be used to determine the strengths and improvement opportunities of the organization in terms of its performance and continual improvement. Self-assessment can assist the organization to prioritize, plan and implement improvements and/or innovations, where necessary.

The Hospital shall conduct at least one cycle of self-assessment before applying for Green and Clean Standard Certification and also before the mid-term review as well as the recertification audit.

## 6. Assessment Duration calculations

Size of Hospital	Assessment Criteria		
	Main Audit	Surveillance Audit	Recertification
Up to 100 beds	3.5	2.5	2.5
101- 300 Beds	4.5	2.5	3.5
300+ Beds	6.5	3.5	4.5

## 7. Assessment process

- a) Assessor team of Bureau VERITAS will comprise of Environment, Health and Safety qualified assessors accompanied with medico specialists
- b) The Assessment will follow a review of SAQ submitted by the Hospital. The audit plan will be prepared by assessment team and report with identified findings will be prepared by the assessment team
- c) An overall score of  $\geq 60\%$  with no parameter having a rating of 1 would be considered eligible for certification. Parameter (s) with rating of 1 shall require either an on-site or off-site verification. This decision shall be announced by assessment team during the closing meeting post completion of the assessment.
- d) Parameters having a rating of '1' shall require a corrective action plan (CAP) by the hospital. The hospital shall submit the corrective action plan within 30 calendar days from the last date of the audit. Verification of corrective action plan would be performed by assessment team either by on-site or off-site verification of its implementation based on its findings. Upon satisfactory



implementation of CAP, re-rating will be performed by assessment team and a final score will be declared. The process for verification of corrective actions and subsequent re-rating would be typically performed over the next 15 days period post submission of CAP by the hospital. The certificate would then be issued within the next maximum 15 days from the confirmation of the corrective action acceptance by the assessment team leader.

- e) For score with less than 60%, a full re-assessment will be performed as per the above-stated man days for the respective types of audits. The rest of the process follows the same approach as per point (d) above.
- f) In case of score below 60% during the surveillance audit, the certificate would be suspended for a period of 3 months. The suspension can be revoked after conducting an onsite follow-up audit, as explained in point (e) above, which shall be conducted before the end of these 3 months. Failure to do so or unsuccessful follow-up shall result in withdrawal of the certificate.
- g) Any time during the 3 years validity a special assessment can be requested by hospital in order to demonstrate higher level of compliances so as to get a re-rated and upgrade current certification level to higher level. Such assessments will be performed as equivalent to surveillance man day's assessment. The special assessment will not waive a routine assessment or recertification assessments within the validity of 3 year period.

## VI. APPENDIX

### APPENDIX A: PILLAR 1: LEADERSHIP AND COMMITMENT

#### 1.1 Management Responsibility:

- ▶ For good building management plan refer to Guidelines for The Construction Establishment and Maintenance of Private Hospital and Day Procedure Facilities, Australia, 3rd edition 1998.
- ▶ A good guidance document can be Guidelines for Infrastructure and Asset Management Plan Template, draft v6 for pilot council review, Sept 2006
- ▶ Essentials of asset management, a Zetes white paper, [www.zetes.com](http://www.zetes.com)
- ▶ A good reference note is Essentials of Asset Management, a Zetes white paper and U.S. Department of Health and Human Services Medicare Hospital Value-Based Purchasing Plan Development.
- ▶ Environment (Protection) Act, 1986 and the Rules
- ▶ North American Green Purchasing Initiative (NAGPI), A Buyer's Guide, [www.cec.org/nagpi](http://www.cec.org/nagpi)
- ▶ Guide to Choosing Safer Products and Chemicals Implementing Chemicals Policy in Health Care.



- ▶ North American Green Purchasing Initiative (NAGPI), A Buyer's Guide, [www.cec.org/nagpi](http://www.cec.org/nagpi)
- ▶ Motor Vehicle Act 1988 and The Central Motor Vehicle Rules 1989
- ▶ Healthy Hospital Healthy planet Healthy people - Addressing climate change in health care settings. North American Green Purchasing Initiative (NAGPI), A Buyer's Guide, [www.cec.org/nagpi](http://www.cec.org/nagpi)

## 1.2 Infrastructure Management:

- ▶ Environment Protection Act (EPA), 1986 - An Act to provide for the protection and improvement of environment and for matters connected there with. Managing Your Environmental Responsibilities: A Planning Guide for Construction and Development, EPA/305-B-04-003, can also be used as a good guiding reference.
- ▶ **'Rainwater Harvesting'** is an important component for achieving the goals of 'Water Security, Shelter Security and Ecological Security' enunciated in the Hon'ble Chief Minister's 15 Point programme. The Kerala Municipality Building Rules, 1999, amended by a notification dated January 12, 2004 (Local Self Government Department Notification) includes mandatory rain water harvesting.
- ▶ Managing Your Environmental Responsibilities: A Planning Guide for Construction and Development, EPA/305-B-04-003. Federal Environmental Requirements for Construction: What Do You Need to Consider? EPA305-F-03-007, [www.epa.gov](http://www.epa.gov)
- ▶ American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHARE) guidelines and Indian Society of Heating, Refrigerating and Air-conditioning Engineers (ISHRAE/RAMA/AHRI) Standard 365- 2009 can be good resource. Environment (Protection) Act, 1986 and Rules. National Ambient Air Quality Monitoring Series; NAAQMS/2003-04. Guidelines for Ambient Air Quality, Monitoring, CPCB, April 2003. Carbon Dioxide Monitoring for Indoor Air Quality, Application Note: AN1/2012/04 is some of the reference documents.

## PILLAR 2: LEGAL COMPLIANCE

### 2.1 Determination of Legal and Other Requirement

- ▶ HCO shall follow National Building Code 2005 guidelines. Indian Public Health Standards (IPHS) 2011 (revised) guidelines for district hospital can also be followed.
- ▶ Managing Your Environmental Responsibilities: A Planning Guide for Construction and Development, EPA/305-B-04-003. Air (P and C. P) Act, 1981 and the applicable rules there under and Noise Pollution (Regulation and Control) Rules, 2000.
- ▶ National Building Code (NBC) 2005 and IPHS 2011 (revised) guidelines for district hospital can be referred.



- ▶ A good reference is Health Technical Memorandum (HTM) 2022 and NFPA's Medical Gas and Vacuum System Installation Handbook. The organization shall adhere to statutory provisions of Indian Explosive Act, Gas Cylinder Rules and Static and Mobile Pressure Vessel (unfired) Rules. Occupational Safety and Health Administration (OSHA) 1970 standards provide information on the rule making process for workplace health and safety. OHSAS 18001 is an international occupational health and safety management system specification can also be referred to.

## 2.2 Bio-Medical Waste Management

- ▶ Refer to BMW Rules 1998, and SPCB, Environment (Protection) Act, 1986 National Guidelines on Bio medical Waste Management, under Bio medical waste (Management and Handling) Rules 1998
- ▶ Infection Control Committee can be a part of Waste Management Advisory Committee.
- ▶ ISO 14051 may be identified as a guidance document. WFN garbage Collection, Law no. 2005-6, Protocol for Disposal of Bio Medical Waste. National Guidelines on Bio medical waste management, under Bio Medical Waste (Management and Handling) Rules 1998.
- ▶ A good reference to achieve zero waste is UCLA Zero Waste Plan, World Health Organization publication on Safe Management of Wastes from Health Care (Geneva, 1999), National Guidelines on Bio Medical Waste Management, under Bio Medical Waste (Management and Handling) Rules 1998. World Health Organization publication Safe Management of Wastes from Health Care (Geneva, 1999), Centre for Disease Control, Standards for Management of Infectious Wastes, Atlanta, GA
- ▶ National Guidelines on Bio Medical Waste Management, under Bio Medical Waste (Management and Handling) Rules 1998. Hazardous Wastes (Mgt., Handling and Trans boundary Movement) Rules, 2008
- ▶ A good reference is solid waste management. A Guide to Competitive Contracting For Collection Guide No. 16, August 1996. Solid Waste Management Privatization Procedural Manual Medical Waste Collection, Treatment and Disposal.
- ▶ A good reference is Solid-Waste Management a Guide to Competitive Contracting for Collection Guide No. 16, August 1996. Solid Waste Management Privatization Procedural Manual Medical Waste Collection, Treatment And Disposal



## PILLAR 3: ENVIRONMENT SUSTAINABILITY

### 3.1 Water Footprint

- ▶ Water (P and C. P) Act, 1974 and the applicable rules there under, Water (P and C. P) Cess Act, 1977 and the applicable rules.
- ▶ A good reference is Handbook on Optimizing Water Treatment Plant Performance, 1998 and Energy Performance Optimization Guide, NRDC, Nov 2012.
- ▶ Water (P and C. P) Act, 1974 and 1977 and the applicable rules there under.
- ▶ INDIAN STANDARD SPECIFICATIONS FOR DRINKING WATER, IS: 10500, DRINKING WATER SPECIFICATION: IS: 10500, 1992 (Reaffirmed 1993)
- ▶ Water (P and C.P) Act 1974 and 1977.
- ▶ National guidelines on bio medical waste management, under Bio Medical Waste (Management and Handling) Rules 1998.
- ▶ National guidelines on Bio medical waste management, under Bio medical waste (Management and Handling) Rules 1998

### 3.2 Energy Footprint

- ▶ Electricity Act 2003 and Electricity Rules 2005.
- ▶ PJM Manual 18B: Energy Efficiency Measurement and Verification Revision: 01 Effective Date: March 1, 2010 prepared by PJM Forward Market Operations
- ▶ Energy Conservation Act, 2001 (52 of 2001) is a good reference note. It deals with Designated Consumers, Standards and Labelling of Appliances, Energy Conservation Building Codes, Creation of Institutional Set up (BEE) and Establishment of Energy Conservation Fund.
- ▶ PJM Manual 18B: Energy Efficiency Measurement and Verification Revision: 01 Effective Date: March 1, 2010 prepared by PJM Forward Market Operations
- ▶ A good reference is Energy Performance Optimization Guide, NRDC, November 2012.
- ▶ PJM Manual 18B: Energy Efficiency Measurement and Verification Revision: 01 Effective Date: March 1, 2010 prepared by PJM Forward Market Operations
- ▶ Energy Conservation Act, 2001 (52 of 2001) is a good reference note. It deals with Designated Consumers, Standards and Labelling of Appliances, Energy Conservation Building Codes, Creation of Institutional Set up (BEE) and Establishment of Energy Conservation Fund
- ▶ Strategic Plan for new and renewable energy sector for the period 2011-17, Ministry of New and Renewable Energy, 2011. National Policy on Biofuels, Ministry of New and Renewable Energy, GOI.
- ▶ Ozone Depleting Substances (Regulation and Control) Rules, 2000.  
Electricity Act 2003 and Electricity Rules 2005  
Environment Protection Act, 1986



- ▶ Bureau of Energy Efficiency under Ministry of Power, GOI. Electricity Act 2003 and Electricity Rules 2005.
- ▶ A good reference point is Energy Star, a joint program of the EPA and US Department of Energy, offering a catalogue of energy-efficient products. Council of Australian Government (COAG) policy on National Strategy on Energy Efficiency, Oct 2008. Electricity Act 2003 and Electricity Rules 2005
- ▶ For good building management plan refer to Guidelines for The Construction Establishment and Maintenance of Private Hospital and Day Procedure Facilities, Australia, 3rd edition 1998.
- ▶ A good guidance document can be Guidelines for Infrastructure and Asset Management Plan Template, draft v6 for pilot council review, Sept 2006
- ▶ Essentials of asset management, a Zetes white paper, [www.zetes.com](http://www.zetes.com)
- ▶ A good reference note is Essentials of Asset Management, a Zetes white paper and U.S. Department of Health and Human Services Medicare Hospital Value-Based Purchasing Plan Development.
- ▶ Environment (Protection) Act, 1986 and the Rules
- ▶ North American Green Purchasing Initiative (NAGPI), A Buyer's Guide, [www.cec.org/nagpi](http://www.cec.org/nagpi)
- ▶ Environment (Protection) Act, 1986 and the Rules and North American Green Purchasing Initiative (NAGPI), A Buyer's Guide, [ww.cec.org/nagpi](http://ww.cec.org/nagpi)

## PILLAR 4: OPERATIONAL CONTROL

### 4.1 Hospital Infection Control

- ▶ Patient decontamination recommendations for hospital, prepared by The Hospital and Healthcare System Disaster Interest Group and The California Emergency Medical Services Authority, EMSA #233, July 2005. Environment (Protection) Act, 1986 and Rules. The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
- ▶ Plastics Manufacture and Usage (Amendment) Rules, issued by Ministry of Environment and Forests, Notification on 17th June, 2003
- ▶ BS EN 740:1999 can be followed for AGSS
- ▶ Environment (Protection) Act, 1986 and the Rules and North American Green Purchasing Initiative (NAGPI), A Buyer's Guide, [ww.cec.org/nagpi](http://ww.cec.org/nagpi)
- ▶ Green Guide for Health Care (GGHC) Version 2.2, 2008 Revision
- ▶ WHO, 1987. Air Quality Guidelines for Europe, World Health Organization, Regional Office for Europe, European series, No 23, Copenhagen, Denmark. WHO, 2002. Health Effects of Indoor Air Pollution in Developing Countries. 41 pp. National Ambient Air Quality Monitoring





Series: NAAQMS/ 2003-04, Guidelines for Ambient Air Quality, Monitoring, CPCB, April 2003 Carbon Dioxide Monitoring for Indoor Air Quality, Application Note: AN1/2012/04. Air (P and C. P) Act, 1981 and the applicable rules there under

- ▶ (Environment (Protection) Act, 1986 and the Rules
- ▶ MSIH Rules 2000
- ▶ MSIH Rules 2000
- ▶ A good reference is CDC Guidelines for Disinfection and Sterilization in Health Care Facilities, Quality Manual for ISO 9001:2008
- ▶ A good reference point is criteria for selection in Environmental Best Practices for Health Care Facilities | November 2002, JCAHO Environment of Care Standards 1.3, 2.3, 4.0. Guidelines for Buying Environmentally Preferable Products.
- ▶ A good reference is CDC Guidelines for Disinfection and Sterilization in Healthcare Facilities, 2008. Guidelines for Buying Environmentally Preferable Products Environment (Protection) Act, 1986 and the rules

## 4.2 Sanitization process

### Pest Control Process

Effective pest control is essential to keep pests out of premises and prevent them from spreading harmful bacteria.

Pest Control shall be done at periodic intervals. The following points shall be taken into consideration while drawing the terms and conditions of the contract for pest control agency:

- Functional details
  - ▶ It shall contain the scope of work for pest control services and the total floor area provided
- Details of chemicals to be used
  - ▶ Only those chemicals shall be used in hospital setting, which are fit for usage in healthcare industry.

### 4.4 Health and Safety

- ▶ HIRA study to prevent, prepare, mitigate, respond and recover from a myriad of hazards shall be initiated. Emergency Management and Civil Protection Act, Ontario, provides guidance for risk assessment for natural, technological and man-made hazards.



- ▶ Hazardous Materials could be identified as per part II of Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000. Eliminating Mercury in Hospital, Environmental Best Practices for Health Care Facilities November 2002, JCAHO. Environment of Care Standards, 1.3, 2.3, 4.0.

## APPENDIX B

### BIOMEDICAL WASTE MANAGEMENT

Biomedical waste may be defined as "Any waste, generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological."

It is very important to have proper biomedical waste management and handling system as prescribed in the Biomedical Waste (Management and Handling Rules) 1998, otherwise it exposes the patients, visitors and staff to following hazards:

- ▶ Transmission of infections for e.g. hepatitis B, HIV, other microbes etc.
  - ▶ Mechanical injury
  - ▶ Re-circulation of waste
  - ▶ Air pollution
  - ▶ Water pollution
  - ▶ Land pollution
  - ▶ Fire
  - ▶ Breeding of flies and insects
  - ▶ Proliferation of rodents
  - ▶ Loss of aesthetics
  - ▶ Nuclear waste hazards and carcinogenic effects
- 
- ▶ Biomedical waste must be properly managed and disposed of to protect the environment, general public and workers, especially healthcare
  - ▶ and sanitation workers who are at risk of exposure to biomedical waste as an occupational hazard
  - ▶ Hospital shall have a process to review and improve the waste management plan preferably through a committee consisting of all stake holders
  - ▶ Segregation of biomedical waste is the most important step in the management of Biomedical Waste such as recyclable, hazardous, bio medical and e -waste and materials.



- ▶ The biomedical waste from different patient care areas shall be collected and transported to the central biomedical waste collection facility by the hospital attendant or by the staff of the agency to whom biomedical waste disposal services are being outsourced.

## ENVIRONMENTAL CLEANING

Hospital is complex environment that contain a large diversity of infectious flora, many of which may constitute a risk to the patients, staff and visitors in the environment. Transmission of microorganisms within a hospital is complicated and very different from transmission outside health care settings; and hence the consequences of transmission may be more severe.

### Transmission involves:

- ▶ Presence of an infectious agent (e.g. bacterium, virus, fungus) on equipment, objects and surfaces in the health care environment.
- ▶ A means for the infectious agent to transfer from patient-to-patient, patient-to-staff, staff-to-patient or staff-to-staff.
- ▶ Presence of susceptible patients, staff and visitors

In the Hospital, the role of environmental cleaning is important because it reduces the number and amount of infectious agents that may be present and may also eliminate routes of transfer of microorganisms from one person/object to another, thereby reducing the risk of infection.

Health care organisations may be broadly categorized into two components for the purposes of environmental cleaning:

### While components of hospital clean are as:

- b) Hospital facility that is involved in direct patient care; this includes patient bed space/room (including nursing stations); procedure rooms; bathrooms; clinic rooms; and diagnostic and treatment areas. Areas designated in the hospital component are cleaned with a "Hospital Clean" regimen.
  - ▶ In intensive care units (ICUs), the patient environment is the room or bed space and items and equipment inside the room or bed space.
  - ▶ In the nursery/neonatal setting, the patient environment is the incubator or bassinet and equipment outside the incubator/bassinet that is used for the infant.
  - ▶ In ambulatory care, the patient environment is the immediate vicinity of the examination or treatment table or chair, and waiting areas.
  - ▶ In some care environments, e.g., mental health, long-term care, paediatrics, the patient environment may be shared space, such as group rooms, dining areas, playrooms, central showers and washrooms etc.



Cleaning disrupts transmission of these microorganisms from the contaminated environment to patients and health care providers. Improving cleaning practices in hospital and other health care organisations will contribute towards controlling health care-associated infection and associated costs. Hand hygiene is the most important and effective measure to prevent the spread of health care-associated infections. Therefore, hand hygiene must be practiced:

- ▶ Before initial patient/patient environment contact (e.g. before coming into the patient room or bed space).
- ▶ After potential body fluid exposure (e.g. after cleaning bathroom, handling soiled linen, equipment or waste etc.).
- ▶ After patient/patient environment contact (e.g., after cleaning patient room; after cleaning equipment such as stretchers; after changing mop heads etc.).

Dedicated hand washing sinks are required for hand washing with soap and water, to avoid splash back of microorganisms onto clean hands during rinsing. Hand washing sinks must not be used for other purposes, such as disposal of fluids or cleaning of equipment.

Personal protective equipment (PPE) for health care providers and other staff refers to a variety of barriers used alone or in combination to protect mucous membranes, airways, skin and clothing from contact with infectious agents and from chemical agents.

**Personal Protective Equipment (PPE) includes the following:**

- ▶ Heavy duty gloves
- ▶ Impermeable plastic apron
- ▶ Gum boots
- ▶ Disposable mask and caps
- ▶ Eye protection wherever required

**Cleaning staff shall wear PPE:**

- ▶ For protection from microorganisms.
- ▶ For protection from chemicals used in cleaning.
- ▶ To prevent transmission of microorganisms from one patient environment to another.

**VII- ACKNOWLEDGEMENT**

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- ▶ Dr. Girdhar Gyani, Director General, AHPI
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- ▶ Dr Sunil Rao, VP (Operations) Columbia Asia Hospitals
- ▶ Dr. Sanjeev Singh, Professor and Medical Superintendent AIMS