

UNIT 5

ISO in Logistics and Occupational Hazards

5.0 Unit Overview and Description

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5.5 Summary

5.0 Unit overview and description:

This unit gives information about the quality measure in logistic operations with the help of ISO standards. This unit also discusses the environmental issues in logistic operations. Occupational hazards and safety measures are also discussed.

Knowledge and Skill Outcomes:

The unit is expected to impart the following knowledge and skill:

- About the ISO standards in logistics
- About the quality control measures to be adopted in logistics
- About the environmental issues which should be paid attention in present scenario
- About the occupational hazards and safety in logistics

Resource Material:

1. IFRC Logistics Training - Logistics Quality Control, Robeson, J.F., & Copacino W.C., The Logistics Handbook, The Free Press (1994)
2. Authors: Dr. Jean-Paul Rodrigue, Dr. Brian Slack and Dr. Claude Comtois
3. www.mom.gov.sg/.../safety.../

Duration: **Total Hours 30 (Theory 15 hrs Practical 15 hrs)**

Learning Outcomes:

Unit V	ISO in logistics	Outcomes
5.2	ISO in logistics	<ul style="list-style-type: none"> ● Explain the definition of ISO in logistics
5.3	Quality	<ul style="list-style-type: none"> ● Discuss the nature, formulation and quality control cycle.
5.4	Environment	<ul style="list-style-type: none"> ● Explain the meaning of green logistics. ● Identify paradoxical aspects green logistics. Discuss the government intervention and legislation and other aspects to improve environment.
5.5	Occupational hazards and safety	<ul style="list-style-type: none"> ● Discuss various health hazards. ● Explain the safety measures to be taken.

Assessment Planning: (for Teachers):

Unit V	Topic	Assessment Plan	Time plan	Remarks
5.2	ISO in logistics	Exercise: Question & Answer		
5.3	Quality	Exercise: Activity, Group discussion, Question & Answer		
5.4	Environment	Exercise: Debate A field Visit		
5.5	Occupational hazards & safety	Exercise: Activity		

5.1 Introduction:

Efficiency of any business activity is measured through its improvement in quality of goods or services. In logistics too this condition is applied. The quality of services in logistics is measured by the International Organization for Standardization (ISO). ISO decides the standards for improvement in logistics. Accordingly environment plays an important role in logistics because logistic services directly or indirectly associated with environmental pollution. The concluding part of this module discusses about the occupational hazards and necessary safety measures to be taken while conducting various activities of logistics.

5.2 ISO in Logistics:

ISO is defined as International Organization for Standardization. A standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services fit for the purpose.

In logistics the maintenance of certain standards is the need of today. As the trade at international level has been increased and the freight movement also has been enhanced simultaneously. Hence, the setting up and implementation of certain minimum standards is very much needed.

The ISO sets the quality maintenance standards as per the changing conditions.

Exercise

1. Prepare a chart of changes in ISO standards especially for logistics.

5.3 Quality:

In order to discuss about quality one should know about the term quality control. Quality Control (QC) is defined as the operational techniques that sustain the quality of product or service to certain standards. The assurance of quality is a planned and systematic action that is necessary to provide adequate confidence that a product or service will satisfy given requirements for quality. However quality improvement is different from quality control. Quality improvement is the purposeful change of a process to improve the reliability of achieving an outcome.

QC is therefore the process of ensuring that the products/services are provided in a cost effective and efficient manner, through the application of well- established systems and procedures. A QC system will therefore also measure whether standard operating procedures are operated effectively and were strictly adhered to.

5.3.1 Nature of Quality Control:

QC enhances efficiency, effectiveness, and differentiation throughout the logistics process. There are three related areas for value creation namely goals, responsibilities and benefits.

Goals: Objectives must be set for achieving internal and external user satisfaction. This involves finding out exactly how 'users' perceive the services rendered by the logistics function as a whole.

Responsibilities: Determine and assign responsibility for systems and processes that are necessary for creating and sustaining user satisfaction. In many instances, this responsibility spans traditional functional boundaries and may even require re-engineering of some processes.

Benefits: User needs and expectations must be incorporated into the process of logistics delivery, transforming basic functions into benefits that yield value.

QC, when used in conjunction with monitoring and evaluation, leads to a formalization of the quality process.

5.3.2 Formulation of a QC Process:

The evolution of a QC process, is a movement through four distinct phases with notable characteristics:

1. **Quality Control (QC):** Quality control entails the basic procedural and statistical management of quality:
 - defect-free services;
 - Management-driven.

2. **Quality Assurance (QA):** A greater emphasis on achieving user/user satisfaction through user/user-driven quality characterizes. This is the shift from QC to QA:
 - 100% satisfied user/user
 - user-driven
3. **Total Quality Management (TQM):** All stake holders, i.e. management, suppliers, users/users and employees all aligned and working together towards a common goal and ensuring quality service provision. It would cover monitoring of all aspects of management, staff, users/users satisfaction, systems implementation, adherence to processes and procedures and supplier performance.
4. **User Value.** User value reflects the need to do things that create the best competitive net value for the user.

5.3.3 Quality Control Cycle:

Systems and processes are a part of QC. QC is used in developing systems that ensure that goods and services delivered meet or exceed user expectations. It not only verifies the delivery of good quality but also identifies gaps and failures that need to be addressed.



Figure: 5.1 Quality Control cycle

Applying and improving quality management provides benefits such as reduced costs, shorter lead times, the right products being received, timely delivery of services, etc for the logistician and internal

users and leads to improved outcomes/reduced suffering for beneficiaries through x,y,z. It is important to maintain management attention on quality in order to continuously improve the delivery of humanitarian support to the affected communities.

Exercise

Answer the following Questions

1. Define quality control
2. Make a group of 5 to 6 students and discuss about nature of quality control
3. Prepare the chart of quality control cycle

5.4 Environment:

Today, more than ever before, there is an increased consciousness that economic and environmental development can go hand in hand and even be mutually advantageous. Green buildings, rainwater harvesting and harnessing renewable forms of energy have become the norm among socially responsible Companies. But the most environmentally harmful logistics activity is transportation as it contributes to increased levels of green-house gases which in turn cause climate change. Thus logistics is an area that is highly relevant to environmental awareness and eco-friendly strategies. Hence greenness has become one of the code word for a range of environmental concerns in logistics.

5.4.1 Green Logistics:

Supply chain management practices and strategies that reduce the environmental and energy footprint of freight distribution. It focuses on material handling, waste management, packaging and transport. In common with many other areas of human endeavor, greenness became a catchword in the transportation industry in the late 1980s and early 1990s. It grew out of the emerging awareness of environmental problems, and in particular with well-publicized issues such as acid rain, CFCs, waste disposal and climate change. Environmental concepts, such as material flows or the carbon cycle, became readily applicable to supply chain management.

The World Commission on Environment and Development Report (1987), with its establishment of environmental sustainability as a goal for international action, gave green issues a significant boost in political and economic arenas. The transportation industry was recognized as a major contributor to environmental issues through its modes, infrastructures and flows. The developing field of logistics was seen as an opportunity for the transportation industry to present a more environmentally friendly face. The implementation of environmental friendly measures is facing contradictory situations. There are five aspects in which the contradiction is observed.

- a) **Costs:** The purpose of logistics is to reduce costs, notably transport costs. Corporations involved in the physical distribution of freight are highly supportive of strategies that enable them to cut transport costs in a competitive setting. Economies of scale in transportation as well as higher load densities are common cost-saving strategies that concomitantly lead to environmental

benefits in terms of lower fuel consumption per ton-km. On some occasions, the cost-saving strategies pursued by logistic operators can be at variance with environmental considerations that become externalized. This means that the benefits of logistics are realized by the users and eventually to the consumer if the benefits are shared along the supply chain. However, the environment assumes a wide variety of burdens and costs, which form a hierarchy ranging from costs internal to the supply chain to externalized costs. Society is becoming less willing to accept these costs, and pressure is increasingly being put on governments and corporations to include greater environmental considerations in their activities. A salient example concerns food supply chains that have been impacted by lower transport costs, enabling a diversification of the suppliers and longer transport chains. The concept of food-miles has been developed as an attempt to capture the full costs of food distribution by using the distance food is carried as a proxy.

- b) **Time:** In logistics, time is often the essence. By reducing the time of flows, the velocity of the distribution system is increased, and consequently, its efficiency. This is achieved in the main by using the most polluting and least energy efficient transportation modes. The significant increase of air freight and trucking is partially the result of time constraints imposed by logistical activities. The time constraints are themselves the result of an increasing flexibility of industrial production systems and of the retailing sector. Logistics offers door-to-door (DTD) services, mostly coupled with just-in-time (JIT) strategies. Other modes cannot satisfy the requirements such a situation creates as effectively. This leads to a vicious circle; the more DTD and JIT strategies are applied, the further the negative environmental consequences of the traffic it creates.
- c) **Reliability:** Logistics is more concerned about service reliability. Its success is based upon the ability to deliver freight on time with the least breakage or damage. The least polluting modes are generally regarded as being the least reliable in terms of on-time delivery, lack of breakage and safety. Ships and railways have inherited a reputation for poor customer satisfaction. For instance, the scheduled reliability of container shipping around 50%, implying that about half the time a container ship will not arrive at a port terminal at the scheduled day. Lower reliability levels are linked with lower levels of asset utilization and higher inventory levels, which is wasteful and indirectly damaging to the environment. The reliability of the logistics industry is built around air and truck shipments which are the two least environmentally-friendly modes.
- d) **Warehousing:** Logistics is an important factor promoting globalization and international flows of commerce. Modern logistics systems economies are based on the reduction of inventories, as the speed and reliability of deliveries removes the need to store and stockpile. Consequently, a reduction in warehousing demands is one of the advantages of logistics. This means however, that inventories have been transferred to a certain degree to the transport system, especially to roads but also to terminals. Inventories are actually in transit, contributing still further to congestion and pollution. Not all sectors exhibit this trend, however. In some industrial sectors, computers for example, there is a growing trend for vertical disintegration of the manufacturing process, in which extra links are added to the supply chain. Intermediate plants where some

assembly is undertaken have been added between the manufacturer and consumer. While facilitating the customizing of the product for the consumer, it adds an additional external movement of products in the production line.

- e) **Information Technologies:** Information technologies have led to new dimensions in retailing. One of the most dynamic markets is e-commerce. This is made possible by an integrated supply chain with data interchange between suppliers, assembly lines and freight forwarders. Even if for the online customers there is an appearance of a movement-free transaction, the distribution online transactions create may consume more energy than other retail activities. The distribution activities that have benefited the most from e-commerce are parcel-shipping companies such as UPS, Federal Express or DHL rely solely on trucking and air transportation. Information technologies related to e-commerce applied to logistics can obviously have positive impacts but not eco-friendly.

5.4.2 Government Intervention and Green Logistics:

The government intervention and Legislation together are influencing the logistics industry for environmental protection. The pricing policy of governments of Europe and North America countries like charging external costs, road pricing, with the re-appearance of tolls on new highways and bridges built by the private sector, and by congestion pricing, especially in metropolitan areas etc. are influencing the logistics industry directly.

Legislations: controlling the movement of hazardous goods, reducing packaging waste, stipulating the recycled content of products, the mandatory collection and recycling of products are already evident in most jurisdictions. Indeed, it is such legislation that has given rise to the reverse logistics industry. Truck safety, driver education, limits on driver's time at the wheel etc., are among many types of government action to impact the logistics industry.

However, there are several ways to improve the environment along with government intervention and legislation with a bottom-up approach (where environmental improvements are coming from the industry itself through the adoption of best practices). Some of them are as follows:

1. **When Business Interests of the Industry Match the Imperatives of the Environment:** For example, empty movements which range from empty trucking backhauls for regional freight distribution to the repositioning of empty containers across oceans. With the growing sophistication of fleet management and IT control over scheduling and routing, further gains are achievable. Another example is fine tuning the routing and operations of freight transport systems with higher energy prices. The adoption of slow steaming strategies by maritime shipping companies is using the rationale of environmentalism to reduce the fuel consumption and improve the utilization of their ship assets.
2. **The Attitudinal Changes:** These changes are comparable of that which has already occurred in recycling. There has emerged striking public support for domestic recycling. This has been extended by some firms in successfully marketing their compliance and adoption of green strategies. Firms have found that by advertising their friendliness towards the

environment and their compliance with environmental standards, they can obtain an edge in the marketplace over their competitors.

Traditionally, price and quality characteristics formed the basis of choice, but because environment preservation is seen as desirable in general, greenness can become a competitive advantage. Ultimately, pressure from within the industry can lead to greater environmental awareness and respect.

3. **Environmental management systems.** Although governments are involved in varying degrees, a number of voluntary systems are in place, notably ISO 14001 and EMAS (Environmental Management and Audit System). In these systems firms receive certification on the basis of establishing an environmental quality control, the setting up of environmental monitoring and accounting procedures. The obtained certification is an evidence of the firm's commitment to the environment, and is frequently used as a public relations, marketing, and government relations advantage.

Of the three possible directions by which a greener logistics industry may emerge, it is realistic to consider that they will naturally associated in helping to shape the industry of the future. However, by overlooking significant environmental issues, such as pollution, congestion, resource depletion, means that the logistics industry is still not very green. Green logistics remains an indirect outcome of policies and strategies aimed at improving the cost, efficiency and reliability of supply chains. There is growing evidence that green logistics results in increased supply chain performance, it is considered as a favorable change in logistics industry.

Activity

1. Organize a debate on paradoxical aspects of environmental protection and logistics efficiency.
2. Visit your local government organization (i.e municipality or Municipal Corporation) and collect information about environmental awareness about road traffic.

5.5 Occupational Hazards and Safety:

The logistic industry supports the economy in many directions. But, during performance of various activities workers will be exposed to work-related injuries and diseases. It may happen due to ignorance or unawareness of hazards. Hence it is essential to know the health and safety measures to be adopted during the work. This topic is going to be discussed under two aspects

1. Health hazards
2. Safety Measures

5.5.1 Health Hazards and Safety Measures

Health problems during work may be divided into three types

1. Manual handling hazards
2. Chemical hazards
3. Other health hazards

1. Manual Handling Hazards:

Manual handling of materials is one of the most common activities in warehouse. It includes lifting, lowering, pushing, pulling, carrying or holding an object. Injuries to the back, neck, shoulders, arms and hand can occur during this time. Hence it is important to identify the risk factors and take preventive actions.

- Factors that increase the risk of injury are:
 1. Regularly lifting loads over 25 Kgs can result in a higher risk of back injury
 2. Bending or twisting the back during lifting or with the arms above shoulder height will increase stress on the muscles and ligaments.
 3. If the design of work place is not proper such as improper design of shelves, lack of space to move, unsuitable dimensions of furniture and equipment, slippery floors also increase the risk of injury.
 4. The risk of injury increases when the task is carried out more often, faster or over a longer period.
- Measures to be taken to reduce the risk of manual handling injuries:

Automation or lifting equipment such as fork lift trucks, cranes and hoists to minimize the manual lifting of heavy loads.

Re-arranging the lay-out or design of plant, equipment or furniture and reducing the twisting and stretching operations also minimizes the risk of injury.

Height-adjustable trolley should be used to eliminate the risk of lifting the weights from the floor.

Conveyor belts can help reduce lifting and carrying heavy loads.

Packaging should be modified into smaller and less heavy loads.

Use of pallet jacks and trolleys to move goods also minimize the risk.

Training should be given to the workers to practice good manual handling methods to protect themselves from injuries.

2. Chemical hazards:

Some warehouses store chemicals and pack them into containers and bags. Warehouse assistants and deliverymen may be exposed to the chemicals. Hazardous chemicals may be corrosive, irritating, toxic, flammable or carcinogenic. Direct skin contact with some chemicals may cause burns or skin rashes from irritation or allergy. Chemical spills and splashes may damage the eyes. Volatile chemicals such as solvents can be inhaled. High concentrations of vapor or gas can accumulate in poorly ventilated areas. It is therefore important that the workers, who work with chemicals aware of hazards, trained in handling chemicals and follow safe work practices to avoid chemical exposure.

Safe-work practices for handling hazardous chemicals:

- a) Provide local exhaust ventilation where there is a risk of inhalation
- b) Provide emergency showers and eye wash where corrosives are handled
- c) Wear suitable personal protective equipment
- d) Do not allow unauthorized access to hazardous chemicals
- e) Inspecting chemical stores regularly to check for deterioration or leakage
- f) Keep stored quantity to a minimum
- g) Ensure that all chemical containers are properly labeled and warning signs are displayed in and around areas of chemical stores.
- h) No smoking should be allowed at or near the storage area
- i) Suitable fire-fighting equipment should be available
- j) Highly toxic chemicals should be stored in double containment and kept under lock
- k) Acids or alkalis should be stored in plastic or other suitable containers
- l) Reactive chemicals should be stored in isolated, cool, dry areas and away from direct sunlight

3. Other health hazards:

- a) **Noise hazards:** The staff may be exposed to a noisy process or equipment e.g. moving empty drums, driving with a noisy engine etc. If the noise level exceeding permissible exposure level (i.e. 85dB (A) for 8 hours a day), it may lead to hearing loss.

Some of the noise control solutions are

- 1) Replace noisy machinery with substitutes
- 2) Locate noise sources away from hard walls or corners
- 3) Isolate or enclose noise sources
- 4) Construct suitable noise enclosures or barriers
- 5) Maintain machinery and equipment at regular intervals
- 6) Wear ear plugs or ear muffs

b) **Vibration hazard:**

Warehouse workers who deal with forklifts or other powered vehicles may be exposed to vibration hazard. Prolonged and excessive exposure to vibration may lead to lower back pain and disorders of joints and muscles.

Some solutions are providing sufficient cushioning or vibration absorbers on the seats of vehicles, maintenance of machinery and equipment at regular intervals.

c) Thermal stress:

The workers who work under extreme temperature conditions like too hot or too cold may be exposed to thermal stress. It may lead to the health problems like headaches, fatigue and heat disorders like heat strokes, heat cramps and heat exhaustion, hypothermia, frostbites etc.

Some of the solutions to prevent heat stress

- provide proper ventilation for air exchange in warehouses
- avoid thick clothing
- drinking plenty of water to prevent water loss

To control cold exposures

- Avoid standing directly in front of or below refrigeration vents
- Provide thermal insulation for metal handles and tools
- Provide adequate and suitable clothing and gloves

d) Lighting:

Improper lighting in the warehouse can cause eye strain and contribute to serious accidents. Hence, adequate lighting should be provided for workers to be able to work properly.

Activity

1. Make class into two groups and one group should take up the health hazards and the other group should give necessary measures to solve it.

5.6 Summary:

This module discusses the definition of ISO as a quality determining factor. The meaning and role of quality control in logistics which includes environment and explained as green logistics. It is concluded with occupational hazards and safety measures in logistics especially in warehouses have been discussed.

5.7 Test your understanding

1. Define the following
 - a) ISO
 - b) Quality Control
 - c) Total Quality Management
 - d) Environment
 - e) Green logistics
 - f) Manual Handling Hazards
 - g) Chemical Hazards

- h) Noise Hazards
- i) Vibration Hazards
- j) Thermal stress
- k) Lighting
- 2. Distinguish between
 - i) Quality Control and Quality Assurance
 - ii) Green logistics and Logistics
 - iii) Environmental Cost and Transportation Cost
- 3. Discuss the role of ISO in logistics
- 4. Explain the nature of quality control
- 5. Give a brief account of formulations of QC process
- 6. Draw a neat diagram of Quality Control Cycle
- 7. Explain how transport cost reduction is sometimes not environmental friendly
- 8. Analyze how Door-to-Door Services and Just-in-Time services are not environmental friendly
- 9. Air & truck shipment are not environmental friendly but, they are reliable --- Comment
- 10. Analyze how government intervention is necessary to protect environment
- 11. Discuss the role of “government price policy” to protect environment
- 12. What is the role of legislation to protect environment
- 13. Explain how “attitudinal changes” are necessary to control environmental degradation
- 14. Write a note on manual health hazards and its controlling measures
- 15. Discuss the chemical hazards and necessary safety measures to check it

5.8 Practical:

Visit two warehouses nearest to your town and prepare a note on occupational hazards present and safety measures followed.





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Shiksha Kendra, 2, Community Centre, Preet Vihar, Delhi-110092