Indira Gandhi
National Open University
School of Sciences

MSTE-001
INDUSTRIAL STATISTICS-I

Block

2

PRODUCT CONTROL

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BLOCK 2: PRODUCT CONTROL

In Block 1, you have studied that statistical quality control techniques can be broadly classified into two categories:

- Statistical process control (SPC), and
- Product control.

You have learnt about statistical process control in Block 1. Statistical process control is a technique used for understanding and monitoring a process by collecting the data on quality characteristic periodically from the process, analysing them and taking suitable actions whenever there is a difference between actual quality and the specification or standard. Generally, process control can be achieved through **control charts**.

In this Block, we discuss **product control**. Product control refers to control the products in such a way that they are free from defects and conform to given specifications. Generally, product control can be achieved through **acceptance sampling**, which was given by Harold F. Dodge and Harry G. Roming, researchers of Bell Telephone Laboratories in 1920.

In process control, we control the methods used at the time of producing a unit, whereas in product control, we inspect the quality of the units which are produced or received from suppliers or vendors.

This block comprises four units.

In **Unit 5**, we introduce the **acceptance sampling plans for attributes**. We explain what an acceptance samling plan is and how to implement it in industry. We also discuss the basic terminology related to it, such as lot, probability of accepting a lot, acceptance quality level (AQL), lot tolerance percent defective (LTPD), producer's risk and consumer's risk.

In **Unit 6**, we discuss the **rectifying sampling plans for attributes** and their implementation in industry. We introduce average outgoing quality (AOQ), operating characteristic (OC) curve, average sample number (ASN) and average total inspection (ATI).

In **Units 7** and **8**, we discuss the **single** and **double sampling plans for attributes**, respectively. We describe various features of both sampling plans, such as operating characteristic (OC) curve, average outgoing quality (AOQ), producer's risk, consumer's risk, average sample number (ASN), average total inspection (ATI) and how to design these plans.

The following notations and symbols are used in the block.

Notations and Symbols

Sec.	:	Section
Fig.	:	Figure
AQL	:	Acceptance quality level
LTPD	:	Lot tolerance percent defective
AOQ	:	Average outgoing quality
OC	:	Operation characteristic
ASN	:	Average sample number
ATI	:	Average total inspection
N	:	Lot size
n	:	Sample size
n_1	:	Size of first sample
n_2	:	Size of second sample
p	:	Proportion defective (proportion of defective units or lot quality)
p_1	:	Acceptance quality level
p_2	:	Lot tolerance percent defective
d	:	Number of defective units in a sample
d_1	:	Number of defective units in first sample
d_2	:	Number of defective units in second sample
c	:	Acceptance number
P[.]	:	Probability
$P_a(p)$ or P_a	:	Probability of accepting a lot of quality p
$P_p(p)$ or P_p	:	Producer's risk
$P_c(p)$ or P_c	:	Consumer's risk
α	:	Probability of rejecting a lot of AQL quality
β	:	Probability of accepting a lot of LTPD quality