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NONDESTRUCTIVE TESTING

WHAT IS DESTRUCTIVE TESTING?

HARDNESS TEST

↳ NONDESTRUCTIVE ON RCT

↳ DESTRUCTIVE ON KID IMPLANT

Definition of NDT

ANY form of testing which does not affect the final usability of a component.

↳ Depends on test

↳ Depends on component.

Very Destructive tests.

→ Tensile strength test.

→ Fatigue testing.

↳ Cycled loads to failure

Destructive testing relies on STATISTICS

2
NDT allows every component to be tested.

↳ does not mean that you know everything about every component

WHY NDT NOT Destructive?

* to test every component:

↳ e.g. if safety is v. v. important

↳ " quality is very important

↳ if parts are very expensive

vs. Quality Control
Quality Assurance

* IN service testing ...

↳ look for flaws that have occurred
in-use
may have grown from factory process
defects.

↳ Retire components if faulty.
avoiding early failure

↳ extend the life of components

↳ look, see it's ok, return to service

↳ allow defects present (maybe)
watch them over time

↳ espec. important if
components are expensive

↳ Safety

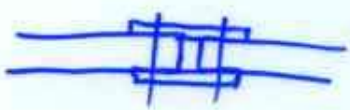
NDT are a continuing process.

- ↳ components & raw materials
- ↳ test before shipping
- ↳ During service
 - ↳ intervals, active process
 - ↳ Having regular, planned NDT allow you to avoid (some) unplanned maintenance



Visual Inspection

- ↳ Railways, Permanent Way.



Testing only needs to see things which will/could cause problems.

- ↳ depends on industry/application

Especially in Visual inspection

But in all other types of NDT too Expertise/Experience is very important

A) WHAT TO LOOK for
& HOW TO LOOK for IT

4

B) INTERPRETING results & making
Decisions afterwards.

Visual Inspection

Look for DAMAGE. ← WEAR & TEAR OR TRAUMA

Look at SHAPE
SIZE
Surface (finish)
CONDITION } → at end of
manufacturing

Aids : optics

Guides e.g. ruler (simplest case)

SURFACE PREPARATION.

↳ e.g. Stain to make flaws
more apparent.

↳ e.g. clean surface

Visual Inspection is generally 1st test performed.

- cheap
- simple
- ubiquitous
everywhere

The Monte Carlo

Book 10

Introduction to the book

Administrative Topics

What is probability theory?

History of PT

Long history starting in the 17th century

Long history of the use of computers

Definition of PT

one set of theory, which allows us to

analyze the stability of a system

by means of the

by means of computer

Some applications of PT

in the study of the stability of

in the study of the

in the study of the

Applications of PT in the study of

100% allow any component to be changed
to that **100%** means that you have
nothing about any changes

100% - all parameters?

It is not any component

Is it any is not required

is it possible? any required

is it possible to be used

- Variable Control
- Variable Allowance

It is not any component

Is it possible to be used

is it possible to be used
any component that is not used
is it possible to be used

Is it possible to be used
any component that is not used

Is it possible to be used
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Is it possible to be used
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Is it possible to be used
any component that is not used

Is it possible to be used

1997 was a particularly STRONG

the company's first year

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6) $\frac{1}{x^2} = x^{-2}$
 $\frac{d}{dx} x^{-2} = -2x^{-3} = -\frac{2}{x^3}$

7) Understanding Property of matrix
Matrix operations

Row Expansion

Take the element in the i th row and j th column as pivot
Take its sign
The
elements } of sign
matrix

Col Expansion

Take any one column as
pivot element
Take sign as +ve if $i+j$ is even
-ve if odd

Minors & Cofactors

- 1. M_{ij}
- 2. C_{ij}
- 3. $M_{ij} = (-1)^{i+j} C_{ij}$