CNC MACHINES AND AUTOMATION

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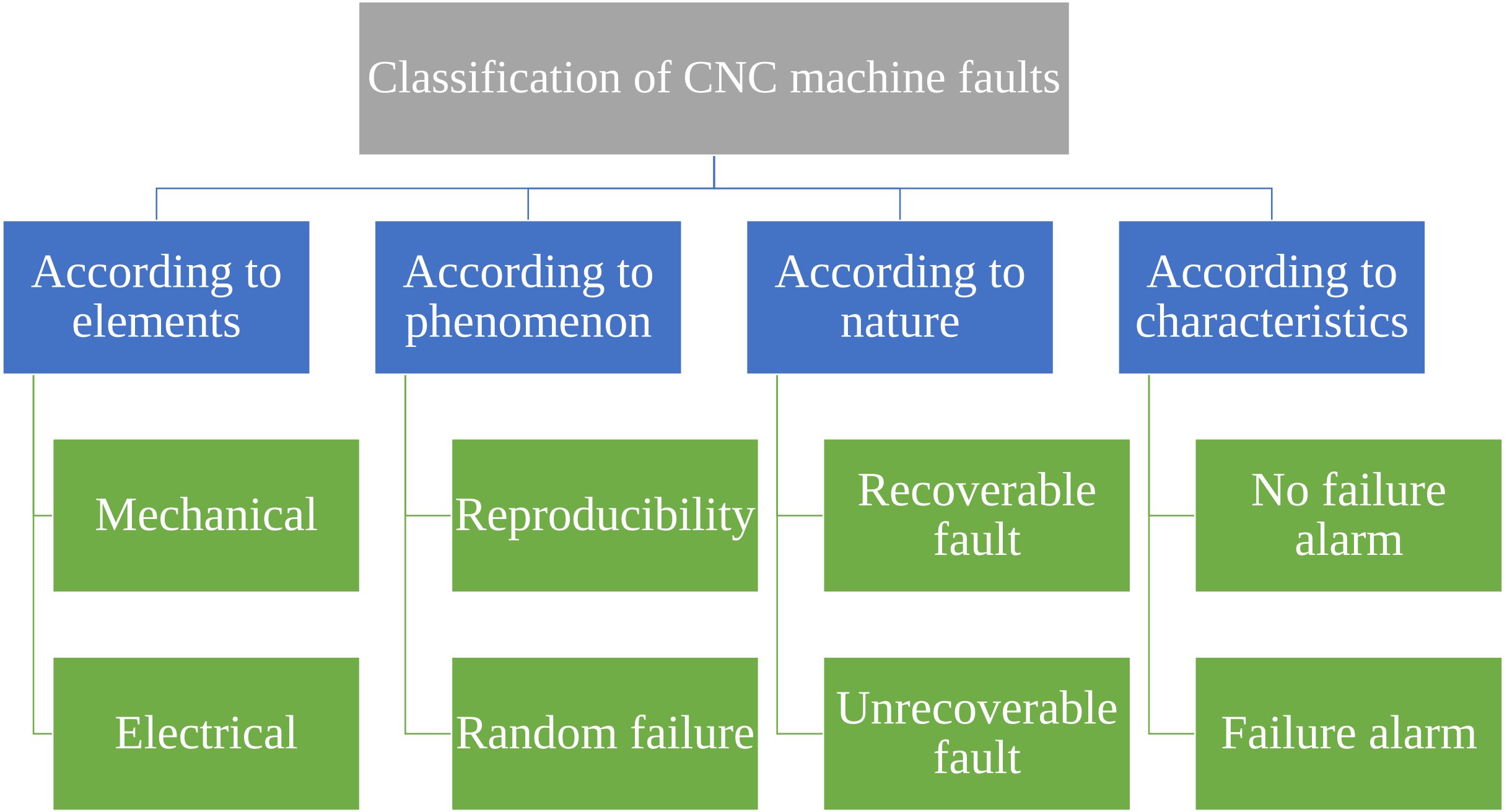
Chapter 5
(Problems in CNC machines)


Classification of CNC machine faults
According to elements
According to phenomenon
According to nature
According to characteristics
Mechanical
Electrical
Reproducibility
Random failure
Recoverable fault
Unrecoverable fault
No failure alarm
Failure alarm

Common Problems in Mechanical Components

i) Bed

ii) Tail stock and Head stock

iii) Slideways Tool Pallettes

iv) Mechanical Switches

v) Host part

Common Problems in Electrical Components

i) Switching Devices

ii) Solenoids

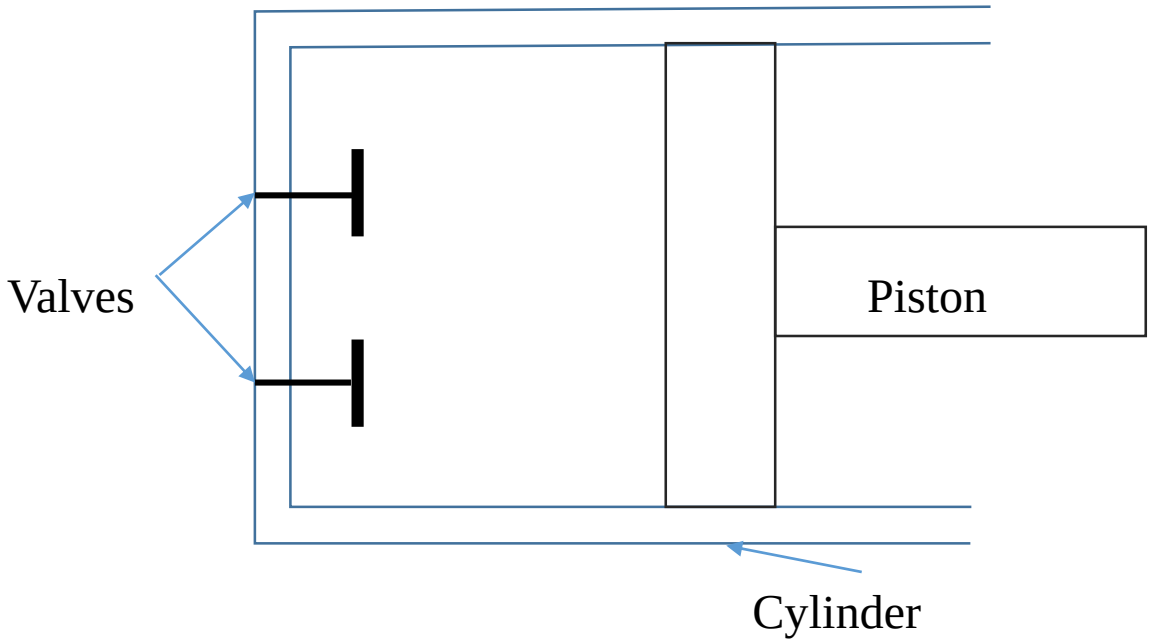
iii) Drive System

Common Problems in Pneumatic Components

i) Cylinder

ii) Piston and Piston rings

iii) Valves



Common Problems in Electronic Components

i) Display Screen/Monitor

ii) Tele Communication Lines

iii) Sensors

iv) Feedback Unit

v) CPU

vi) Converters

vii) Control Panel

Fault finding techniques

- Visual Inspection
- Oscilloscope
- Logic Probe
- Current Tracer
- Logic Pulser
- Logic Clip
- Logic Comparator
- Arbitrary Waveform Generator
- Signature Analyzer
- Digital Multimeter

Fault	Cause	Remedies
1. Panel is not Working	Main Supply is not given to panel. Inbuilt panel short circuit protected M.C. BTO OFF Emergency Stop is pressed. Key switch off.	Main supply is given to panel. M.C.B is always on. Emergency stop is released. Key switch is on.
2. Machine is not working	Supply is not given to Panel CNC switch is off.	Proper supply is given to panel. CNC switch is on.
3. We are in CNC software but progress in not exciting.	Power failure Emergency Stop is pressed. Limit switched operated. Communication cable is not connected or it is broken.	Power is on. Emergency stop is released limit switched released communication cable is connected properly.
4. Lubrication motor not working	Proper 240 volt supply not given. Signal relay not working.	Proper 240 volt supply given. Signal relay is changed.
5. X-motor and Z-motor drive not working.	Main supply is not given to drive. Wire is not connected from interfacing card to drive. Motor wires are broken. Communication fail.	Main supply is given to drive. Interface wire is connected properly. Check Motor wires are proper connect.
6. The material barns on outside edge.	Tool is blunt Feed speed too low	Replace with sharp tool Increase feed speed
7. Burnt edge of holes	Tool is blunt Tool put in wrong spindle	Replace with sharp tool Insert tool in correct spindle
8. Rough edge , cutter marks visible	Machine is travelling too fast	Reduce the feed speed
9. Component not the correct size	Tool data has been entered incorrectly Component size is entered incorrectly	Edit tool data setting Edit component data

Online Time Fault finding/Diagnosis Tools in CNC machines

i) Direct Observation Method

ii) Make use of the CNC system hardware, software and alarm function

iii) Hammering method

iv) Theory analysis method

v) Measurement comparison method

vi) Interface signal method

vii) Self diagnosis technique

viii) Parameter test method

ix) Malfunction and failure analysis

x) Control start-up diagnosis

xi) Preventive maintenance notices

xii) Tool life monitoring Programming diagnostics

Thank You