4 Days ADIPS Hydraulics/Pneumatics Course Syllabus

National Fluid Power Centre UK, Carlton Rd, Worksop, Nottinghamshire, S81 7HP

2.5 Days Hydraulics

1.0	**Basic Hydraulic Principles**
	1.1 7 Basic rules that underpin all hydraulic systems 1.2 System relationship between pump size, speed and flow rate 1.3 Power inputs and power outputs 1.4 Relationship between motor torque, displacement and pressure 1.5 Relationship between motor speed, displacement and flow rate 1.6 Causes of heat generation 1.7 Relationship between cylinder force, area and pressure 1.8 Relationship between cylinder speed, volume and flow rate 1.9 Regenerative cylinder performance
2.0	**Hydraulic symbols and notation.**
3.0	**Pressure control valves - function & operation.**
	3.1 Relief valves - pilot and two stage. 3.2 Vent control. (unloading principle) 3.3 Sequence valves. 3.4 Pressure reducing valves - two way and three way.
4.0	Flow control devices- function & operation.
	4.1 Orifices. 4.2 Throttle valves - non-compensated & compensated
5.0	Direction control valves - function & operation.
	5.1 Check valves & P-O checks 5.2 Sliding spool valves (brief)
6.0	Pumps - types, operation and performance
	6.1 Gear pumps. 6.2 Vane pumps. (Fixed & Variable) 6.3 Piston pumps. (Fixed & Variable) Introduction to Pressure Compensation
7.0	**Hydraulic Fluids**
	7.1 Oil types and selection considerations 7.2 Control of Fluids & Storage 7.3 Contamination control relating to: - a) achieving target cleanliness levels b) maintaining cleanliness standards throughout the organisation
8.0	Accumulators - application & safety.
	8.1 Bladder. (brief introduction)
9.0	Practical hydraulics
	11.1 Pump performance testing 11.2 Setting up procedures for relief valves, pressure reducing valves & flow control valves 11.3 Component identification and circuit construction
10.0	Safe working practices.

1.5 Days Pneumatics

1.0	**Basic Principles of Compressed Air Use**
	1.1 What is air? 1.2 Understanding the properties of air (its physical attributes) 1.3 Know the relationship between pressure, force and area 1.4 Know the relationship between volume, pressure & temperature
2.0	**General Layout of a Compressed Air System**
	2.1 Compressor air intake arrangements 2.2 Air cooling arrangements and requirements 2.3 Air drying arrangements and requirements 2.4 Storage of compressed air (use of receivers & their features) 2.5 Know the importance of condensate removal and treatment methods 2.6 Understand the methods of oil removal (the need for CLEAN AIR)
3.0	**Compressors (Operating Principles and Selection)**
	3.1 The reciprocating compressor 3.2 The screw compressor 3.3 The vane compressor 3.4 Self lubricating compressors
4.0	**Distribution Systems**
	4.1 Understanding pipe work installation (take-offs and inclination) 4.2 The need for and methods of condensate management and removal 4.3 The Filter\Regulator\Lubricator (FRL) unit and principle of operation
5.0	**Cylinders (Types and Application)**
	5.1 Know the construction, operation & application of: 5.2 Single acting and double acting cylinders 5.3 Rod less cylinders 5.4 Rotary actuators and grippers
6.0	**Pneumatic Components and Symbols (to ISO standards)**
	6.1 Valves (methods of actuation and control) 6.2 Direction controls (types and performance) 6.3 Flow controls (one way and two way control) 6.4 Pressure controls (reduction and relief)
7.0	**Practical Exercises**
	7.1 Construct pneumatic circuits with pilot operation and control

Course Dates:

- **18-21 July 2011**
- **3-6 October 2011**

ADIPS Registration

Inspectors registered for Hydraulics/Pneumatics disciplines for In-Service Annual Inspection must have attended and passed this course or achieved an equivalent standard by 2012 registration.

Accredited Prior Learning

Inspectors wishing to claim an equivalent standard must sit and pass a formal knowledge based assessment arranged with ADIPS Ltd.