



**PRESSURE VESSEL**

**Job Overview**

As per the Client's inspection/maintenance team, their major concern was is to know the condition of the pressure vessel welds. Since its critical equipment, the client carries out ACFM periodic inspection every year.

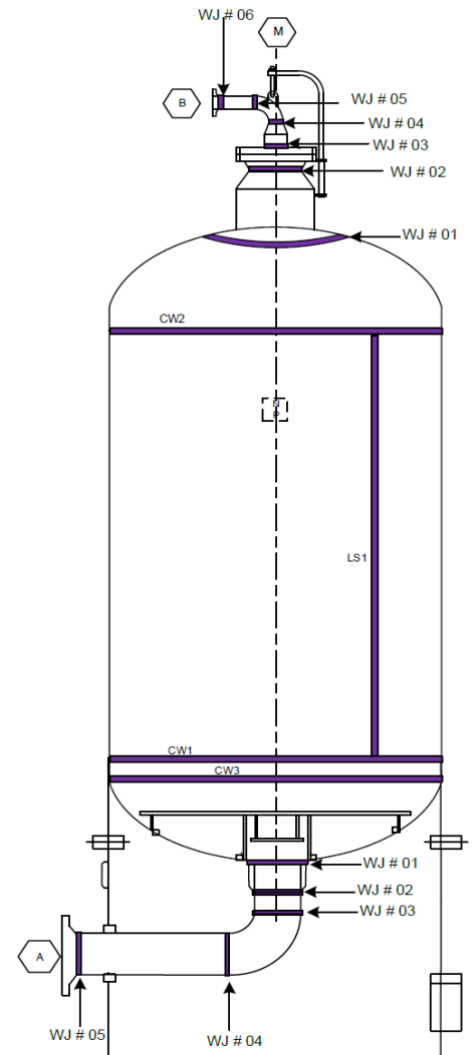
At the end of year 2018, ACFM inspection on 2 Polybed PSA Unit Adsorber and on pipeline weld joints was carried out.

**Scope of ACFM Inspection:**

- ✚ To carry out ACFM Inspection on the weld joints and HAZ areas.
- ✚ To size any surface or near surface cracks detected during the ACFM inspection by measuring the length and depth using the Lizard™ software
- ✚ To mark any anomalies observed for further investigation

**Inspection Procedure:**

- ✚ With reference to the procedure, it is necessary to perform quality assurance sweeps of known defects within a standard reference block (LK 100), for this inspection.
- ✚ Scanning was done at on and both sides of the weld covering the HAZ area.
- ✚ ACFM data was recorded during the examination.



**Fig 1: Pressure Vessel**

**Inspection Equipment Details:**

<b>Item Name</b>	POLYBED PSA UNIT ADSORBER
<b>Material</b>	Carbon steel
<b>Last Inspection</b>	2017
<b>Inspection Done</b>	2018



## Testing Equipment Details:



Fig 2: Lizard M8 system



Fig 3: ACFM Probe Model

## ACFM Inspection Results:

### Findings:

Equipment No	Scanning Location (IP NO)	Indication Details	Findings	Remarks
xxxxx	LS 1	N/A	No Significant Indication Found	Shell weld
xxxxx	CW 1	Length – 9 mm at( 5680 to 5686mm)	Relevant indication found	Bottom dish to shell weld
xxxxx	CW 3	N/A	No Significant Indication Found	Skirt to bottom dish weld
xxxxx	WJ-01	N/A	No Significant Indication Found	Nozzle – A

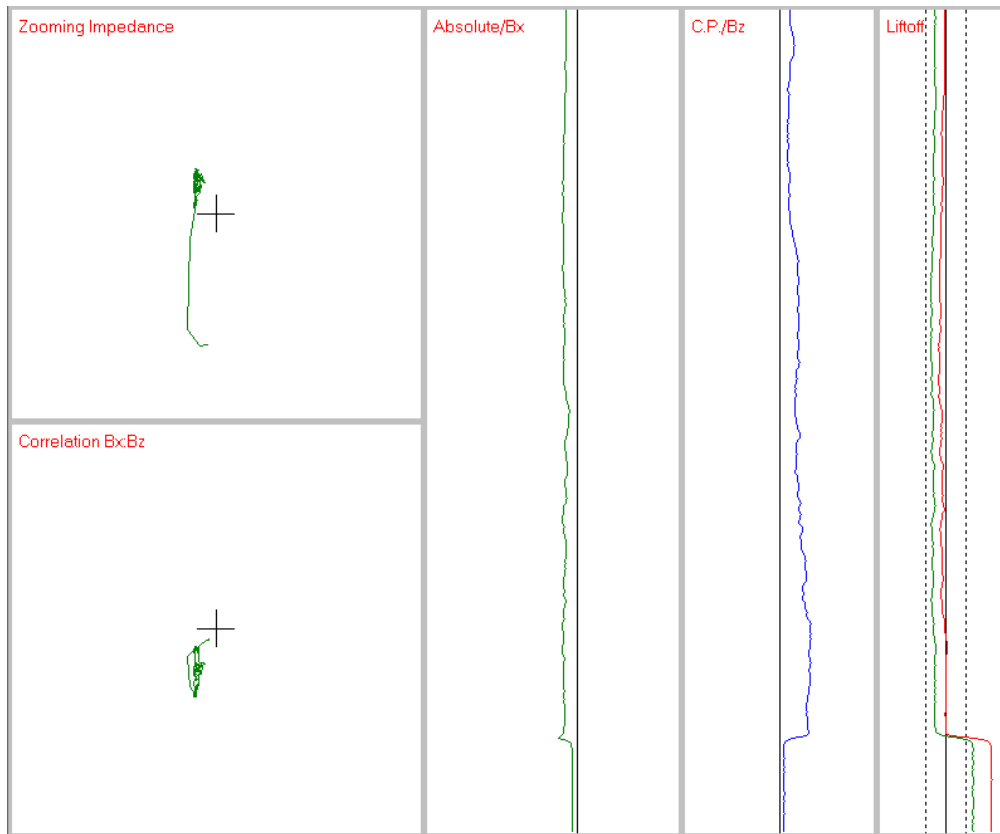


Fig 4: ACFM signal without defect

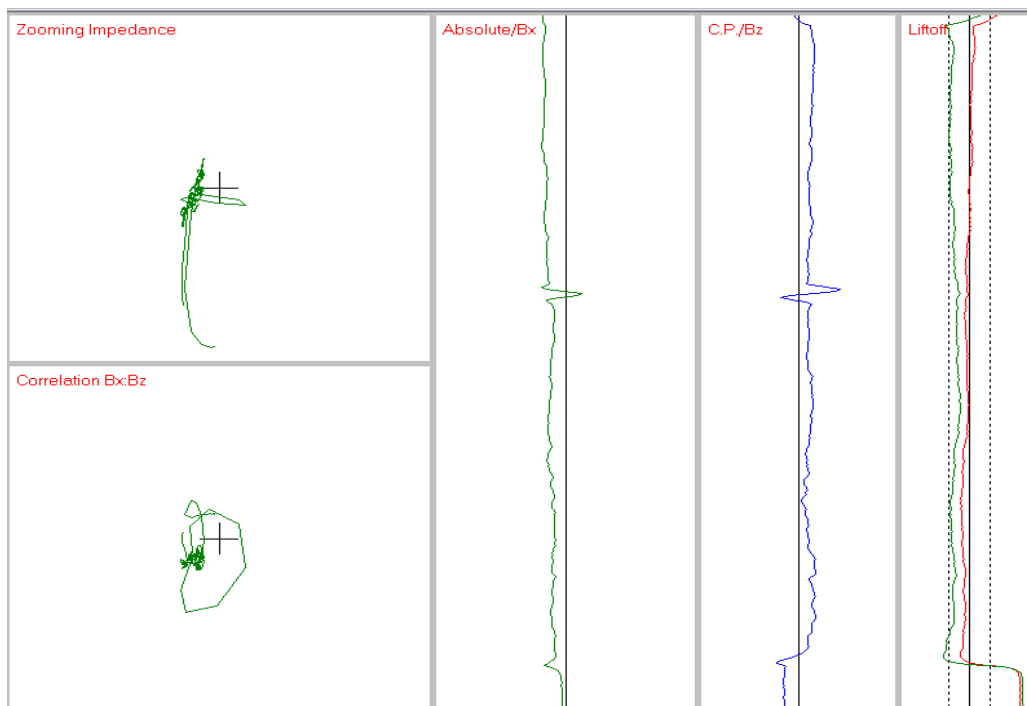


Fig 4: ACFM defect signal

✚ An indication was found at the HAZ area of Bottom dish to shell weld location.



Client decided to verify the defect location with MPI, paint was removed at the location and magnetic particle inspection was carried out and the defect was confirmed. Below images shows the findings during MPI.



**Fig 4: MPI defect signal**



**Fig 4: MPI defect signal with measurement**

## **Conclusion & Recommendation:**

Crack defect indication was found on CW-1 weld during the time of inspection and verified by magnetic particle inspection.

It is recommended that periodic in-service ACFM inspection should be continued for the equipment welds, to detect any new onset of cracks.