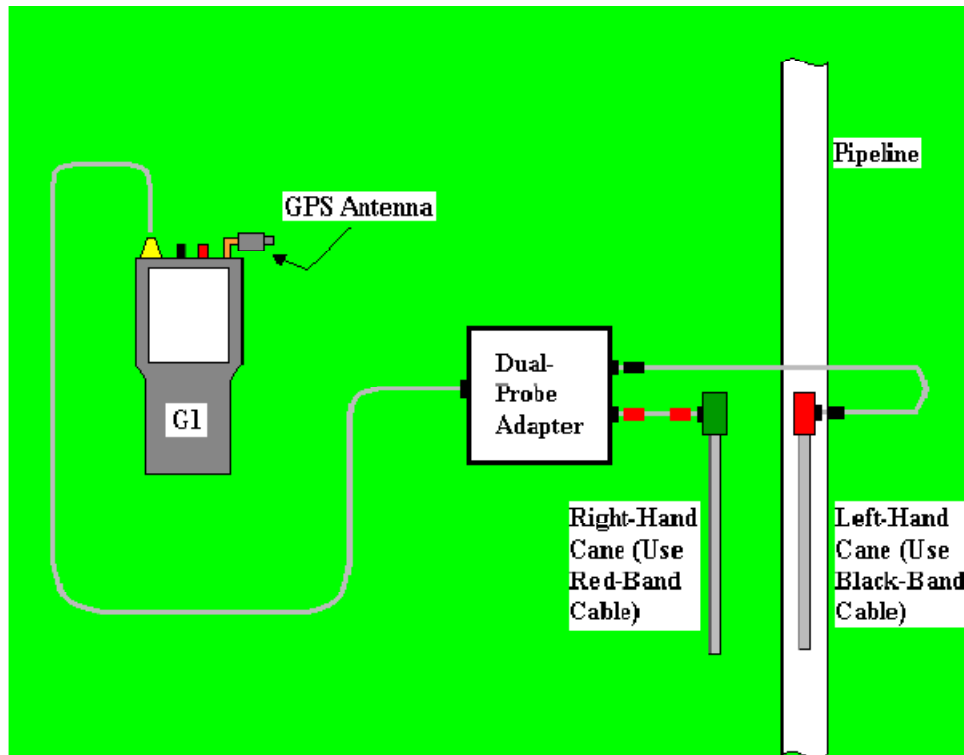


# DCVG TECHNIQUE

- The DCVG is used for:
  1. GPS location of Exposed Holidays (Defects).
  2. Current Direction in the defects. This allow to know if the defect is being or not protected by CPS.
- Previous the performing of a DCVG survey the IR drop must be calibrated in order to have a value of at least 200 mV. If is possible to obtain this value of IR this technique will detect defects bigger than the 10% of IR .
- This technique is compatible with fail safe coatings as Fusion Bond Epoxy or the RD-6 of Polyguard.
- It is not possible to find defect where the coating has failed (Disbondment) and the system used shields the Cathodic protection current.
- During the DCVG survey the current going in or out from a defect causes a variation in the potential of the vicinity. These changes are observed by the evaluator. The higher value observed will be located over the defect location using the perpendicular technique.



# DCVG SURVEYS



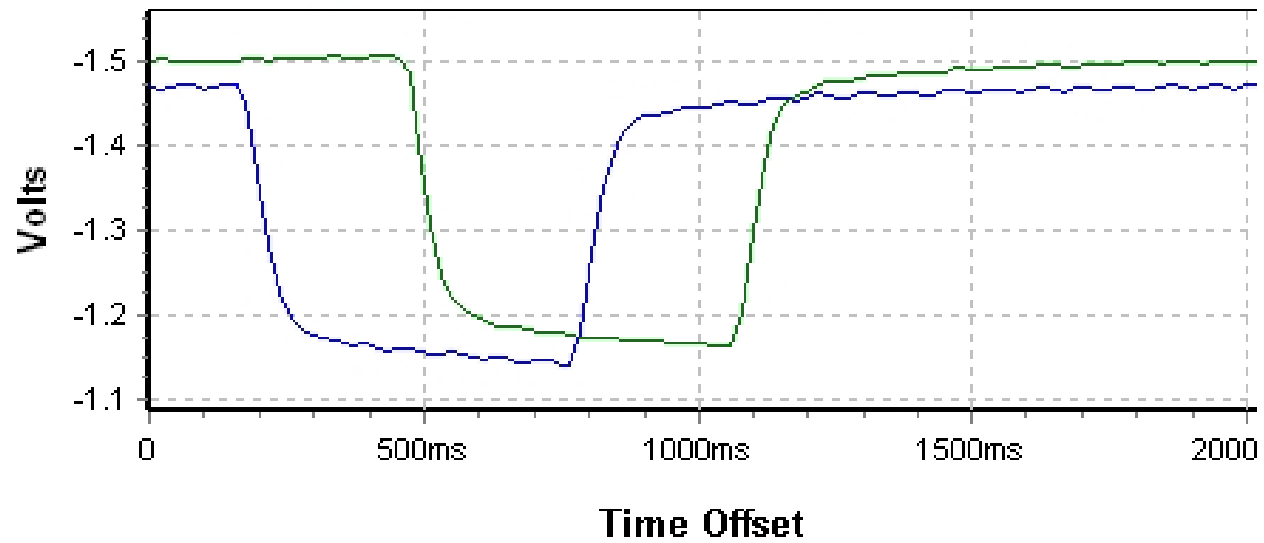
**ARRANGEMENT OF MCM  
EQUIPMENT FOR DCVG SURVEYS**



**G1 DATALOGGER OF MCM**



**[70+00] Single Test Station [70+00]**

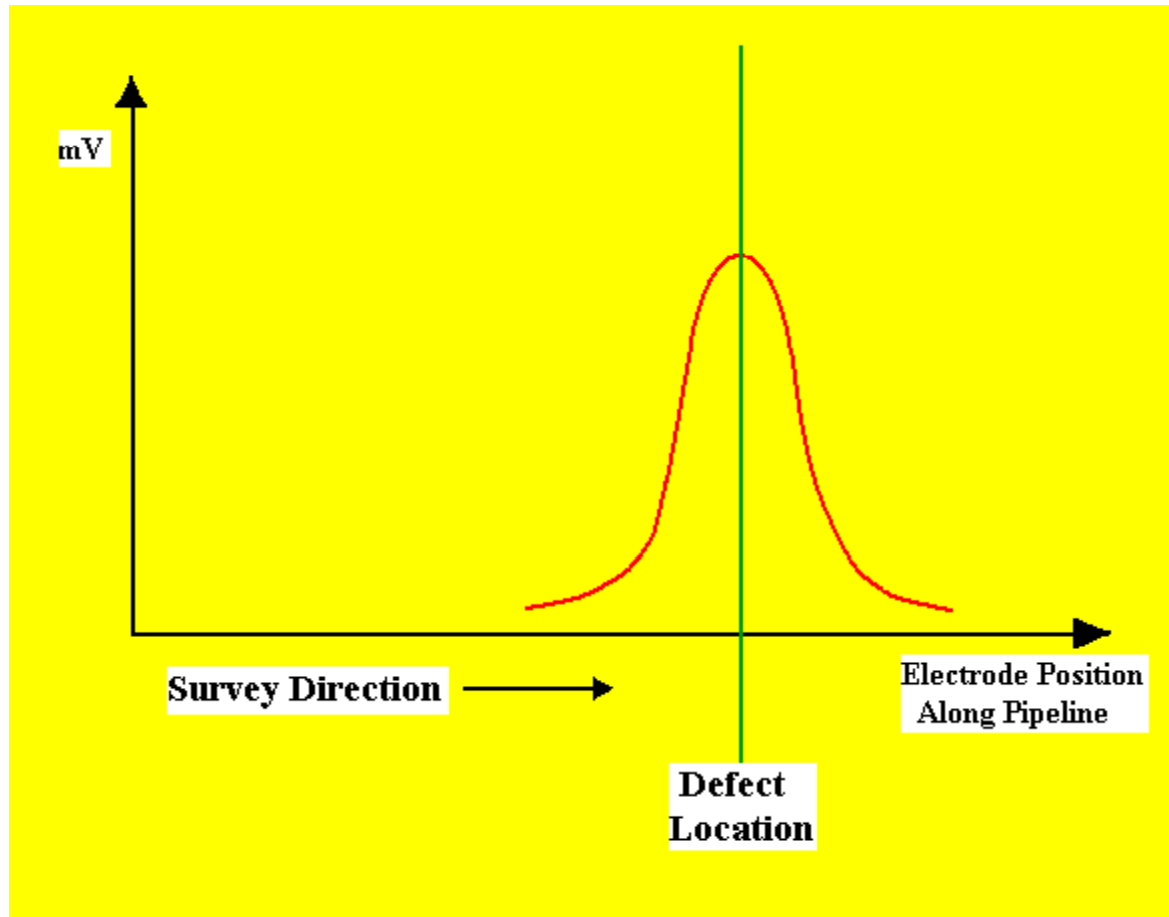


— ONDA CRUDO POSTE KM 7 : Chnl1  
— ONDA AGUA POSTE KM 7 : Chnl1

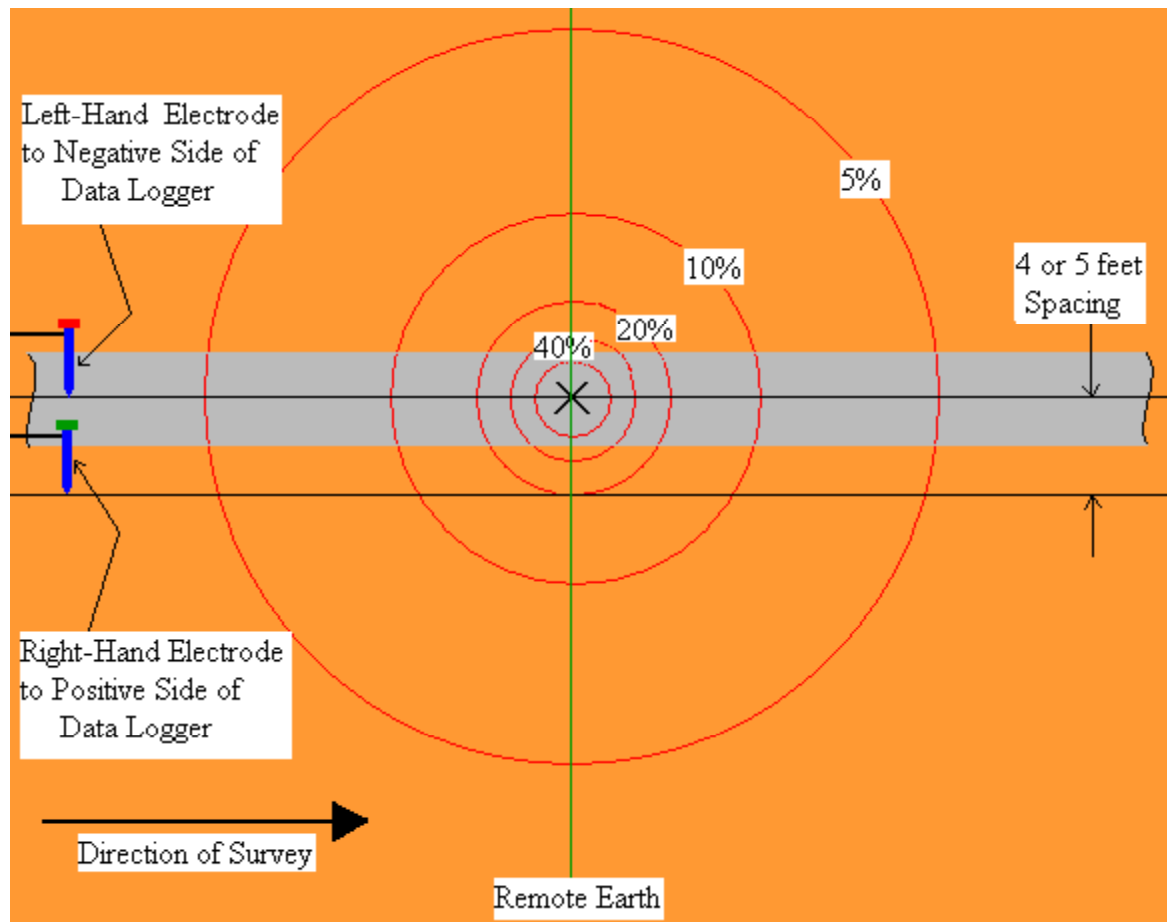
**18/02/2007 20:22:55**

**Single Test Station WAVE Measurement In order to review the IR drop and possible interference**





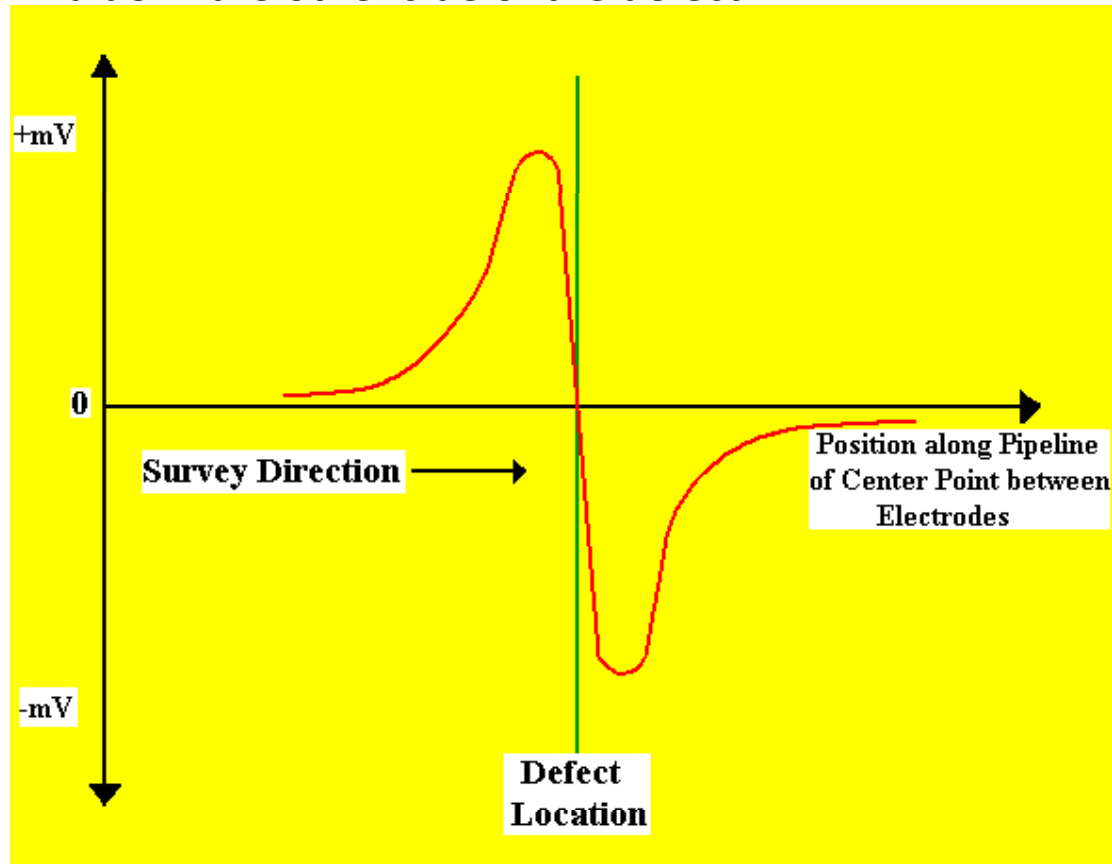
**DCVG Voltage as a Function of the Electrode Position along the Pipeline in the vicinity of the Coating Defect as measured with electrodes in perpendicular configuration**



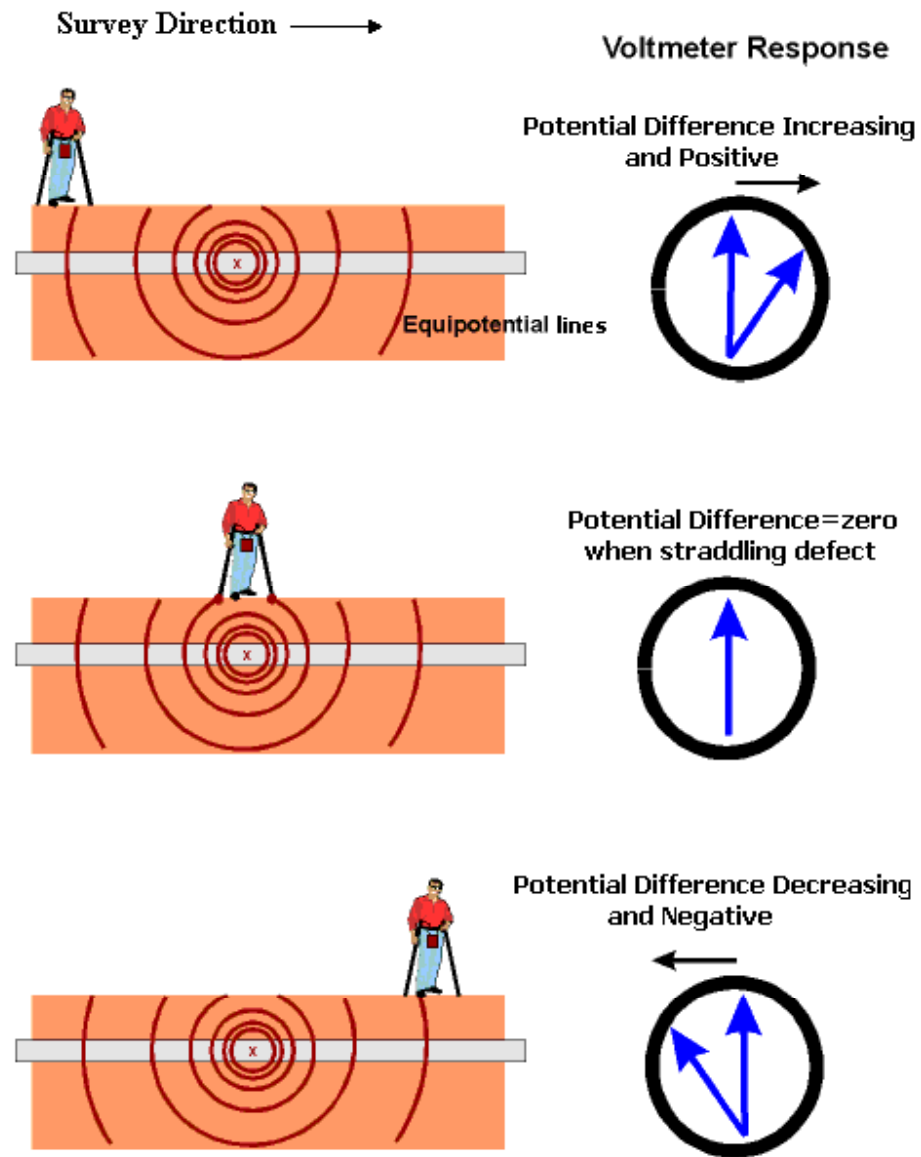
**Reference Electrode Positioning for a Perpendicular DCVG Survey.  
Potential difference measured at the green line will represent the  
maximum voltage recorded (Defect Location)**



- During the In-Line (Parallel) Technique the evaluator will observe a positive value in one side of the defect, zero in the defect value and a negative value in the other side of the defect.



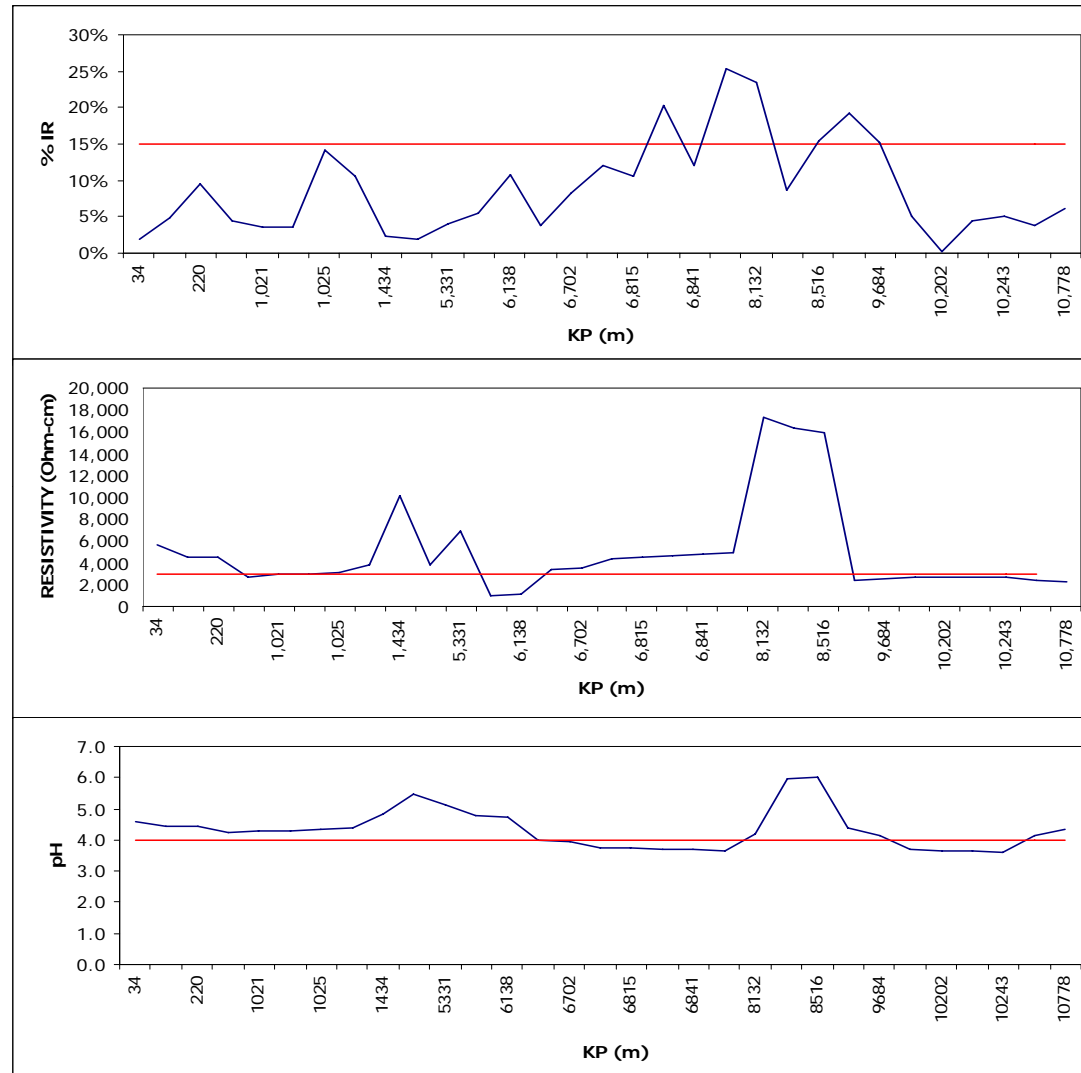
**DCVG voltage in the vicinity of a coating defect as a function of the position along the pipeline of the center point between the electrodes with the electrodes configured in Parallel Technique**



### In Line DCVG Survey Technique



- The DCVG information can be used in conjunction with other surveys such as resistivity, pH, Smart Pig, among others.



**DCVG, Resistivity, pH, Surveys in conjunction**



- *After the DCVG Surveys it is possible to classify the defects as a function of their IR and influence of the CPS.*
- *The defect classification or categorization of the defects will allow to have a reparation program.*

