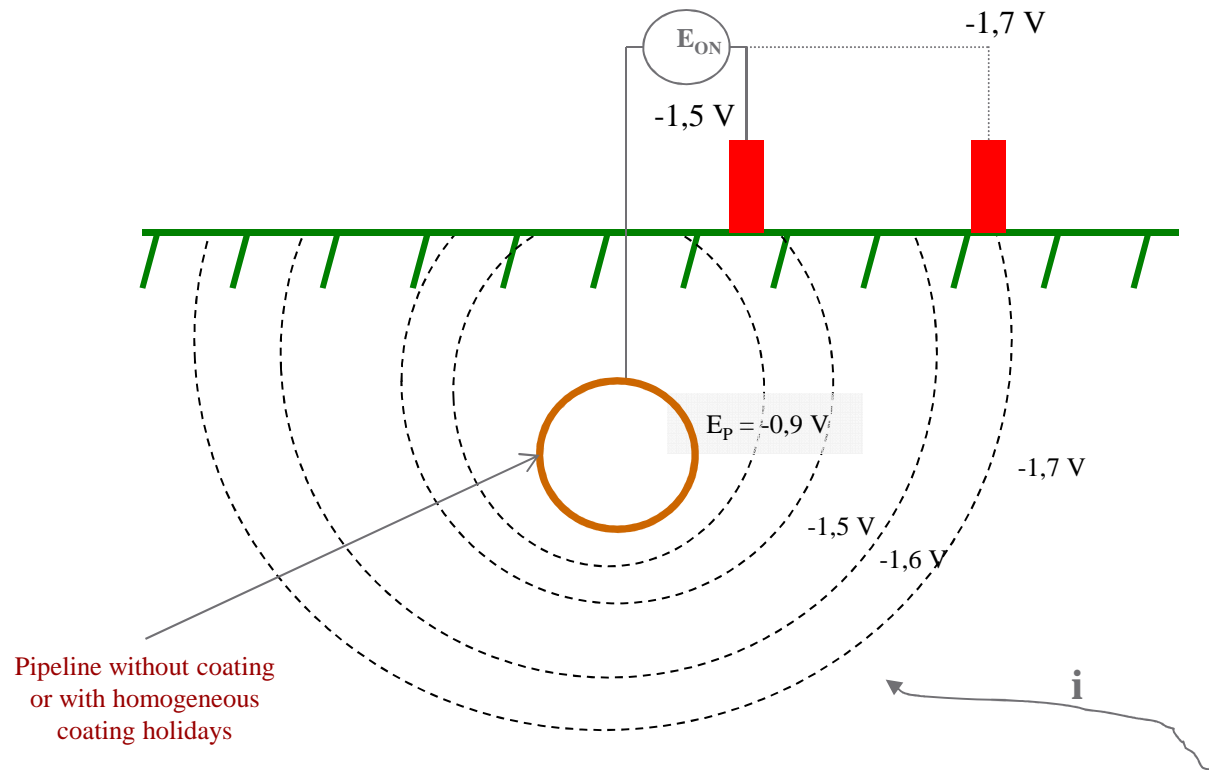




Status of WG D “Off potential measurements”

Ceocor Commission 2
Florence June 2013
Bernard Graux

ON potential measurement



$$E_{ON} = E_p + iR$$

where :

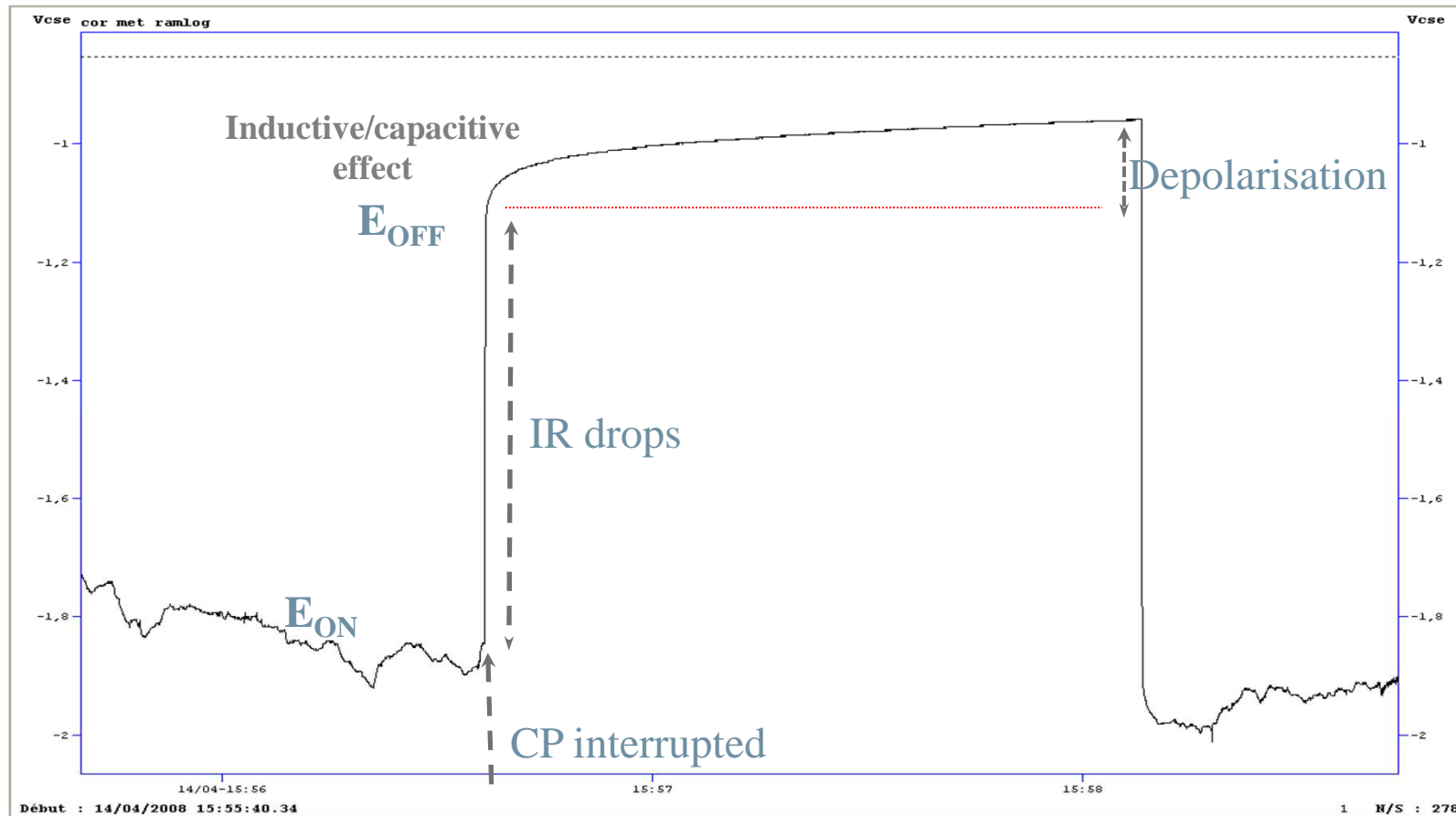
- R due to soil resistivity
- $i = i_p$ (CP) + i_s (stray current)
- E_p : true potential (interface steel/soil)

Ways to decrease iR :

- set reference electrode close to steel surface (coating fault)
- measure instantly after switching current « Eoff »

→ E_{OFF} potential is approaching the true potential E_p also called iR free potential

OFF potential measurement

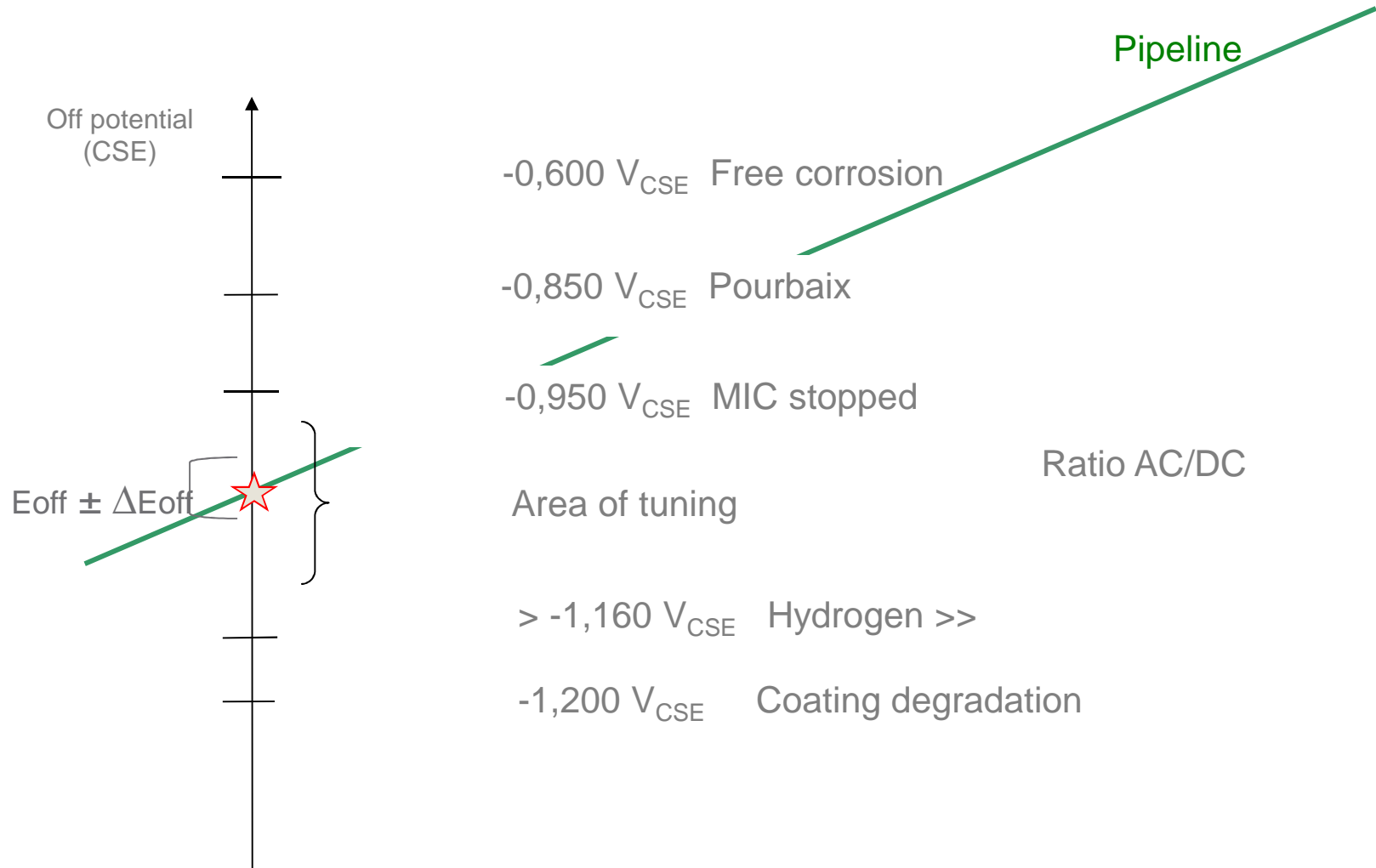


E_{OFF} measured value varies according the selected process of measurement

Concern

- To correctly tune Off potential values all over the length of a structure is quite challenging considering :
 - Scheme effect due to a.e. coating degradation (welding)
 - Influence of DC stray current
 - Microbiologically influenced corrosion above -0,95 V(CSE)
 - Coating degradation and Hydrogen under -1,16 ...1,2 V (CSE)
 - AC-corrosion: taking into account AC to DC ratio

Potential tuning



Starting new Working Group D

- Proposal for a new WG during Lucerne congress validated
- Product scope :
 - to deliver a document (+/-15 pages plus appendix)
 - > Foreword
 - > Description of the concern
 - > Scope of document
 - > Analyses of industrial technologies & practices
 - > Annexes
 - » References of used document
 - » Copy of participant's documentation about Off measurement
 - to promote exchanges of knowledge and experiences in Off measurements
- Delay :
 - tend to edit a final document by Ceocor's congress 2014
- Budget :
 - Only call to intellectual services of participants
 - Participants stand for own expenditure

Project's scope

- Collection of technical references
 - Public literature, articles,...
 - Participants internal documentation relative to Off potential
- Analyze of the technical references
- Identify and comment major factors of influences/errors
- Writing activities for each part of document
- Discuss draft :
 - by mail
 - meetings during congress & autumn's days

Progress of work (1)

- Kick-Off meeting hold in Brussels November 2012
 - Interest of members about the subject confirmed – 22 participants
 - Product & project scopes agreed
 - First round concerning Off measurements practices led to following statements (to be confirmed further on):
 - > no clear and common understanding relative to multiple potential's definition (On- Off- iR free -true potential)
 - > no equal awareness through the members about the difference between the measure of potential and the potential as physical quantity itself . Meanwhile clearer defined in ISO DIS 15589-1:
 - » Off potential is a potential measured (with any available relevant technology)
 - » IR free potential is the real potential without IR drop
 - > purpose of the Off potential measurement deeply contribute to the choice of a specific Off potential measurement technique

Progress of work (2)

- factors of influences / errors might be clustered e.g. :
 - > due to the environment of the structure like
 - » soil resistivity and chemical composition
 - » presence of stray current
 - > due to the technical characteristics of the structure like
 - » real good isolated structure
 - > due to the specification of the measurement device like :
 - » time delay after switching
 - » precision (impedance)
 - > due to the measurement instruction like :
 - » distance between of electrode against steel surface
 - » use of permanent or removable coupon
 - > due to the policy of the company like
 - » purpose of the Off measurement
 - » density of measurement
 - » context of measurement

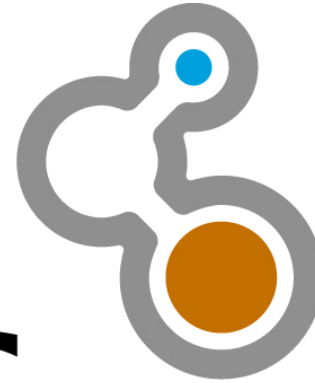
Way forward

- 6th June : Florence's congress session
- 7th June : working group D meeting
- < Ceocor Autumn's days : first draft to be issued

“Unless we can know something without knowing everything,
it is obvious that we can never know something”.

(Bertrand Russel)

FLUXYS



EXCELLENCE IN GAS TRANSPORT