

表一:COMSY 使用者

ARCEVA

WATHEC

COMSY
Condition Oriented ageing
and plant life Monitoring
System

Germany: *Biblis A, B
Brunsbuettel
Gundremmingen B
Isar 1, 2
Grafenrheinfeld
Krümmel
Philippsburg 1*

Switzerland: *Beznau 1
Leibstadt*

Japan: *Tomari 1+2
Fukushima 1-1*

Sweden: *Oskarshamn 3*

Finland: *Loviisa 1+2*

Netherlands: *Buggenum
Moerdijk*

**Flow-induced corrosion
- References**

USA: *Rancho Seco
Millstone-2
Black Dog*

Spain: *Almaraz 1+2
Asco 1+2
Cofrentes
St. Maria de Garona*

Ukraine: *Rowno 1 to 4
Khmelitski 1,2*

Hungary: *Paks 1 to 4*

Bulgaria: *Kozloduy 1 to 4*

Brazil: *Angra 1,2*

UK: *Killingholme
Peterhead
Cottam*

FRAMATOME ANP

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圖 1:水中溶氧量對管路薄化率之影響

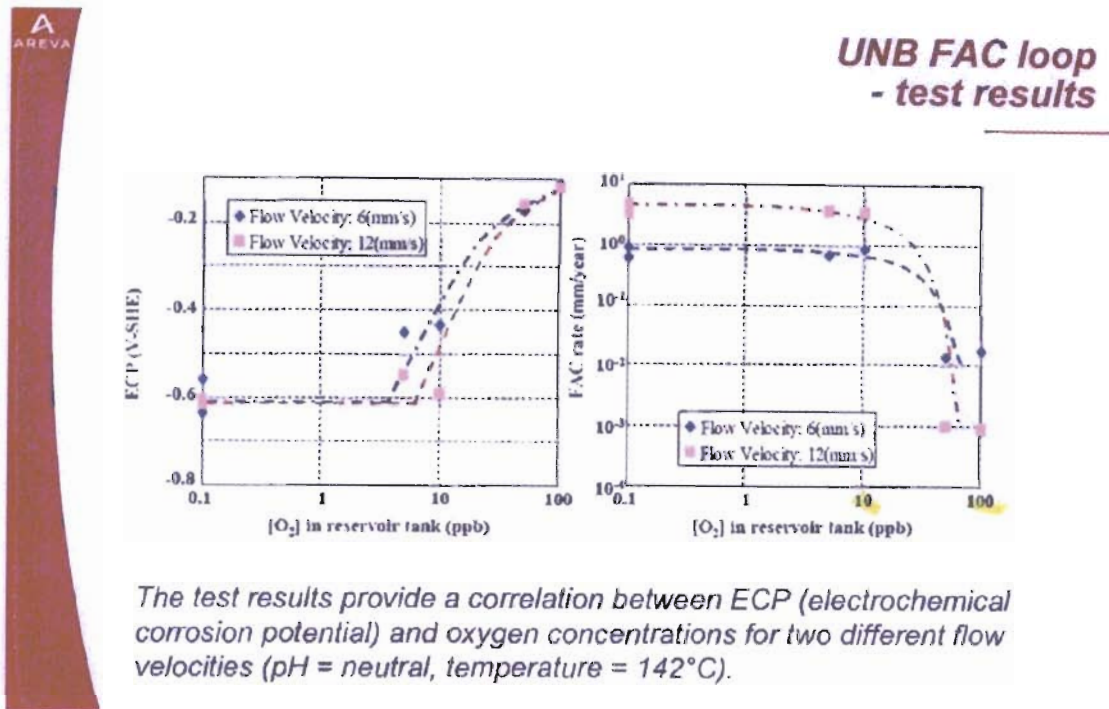


圖 2:驗證 COMSY 軟體累積的數據

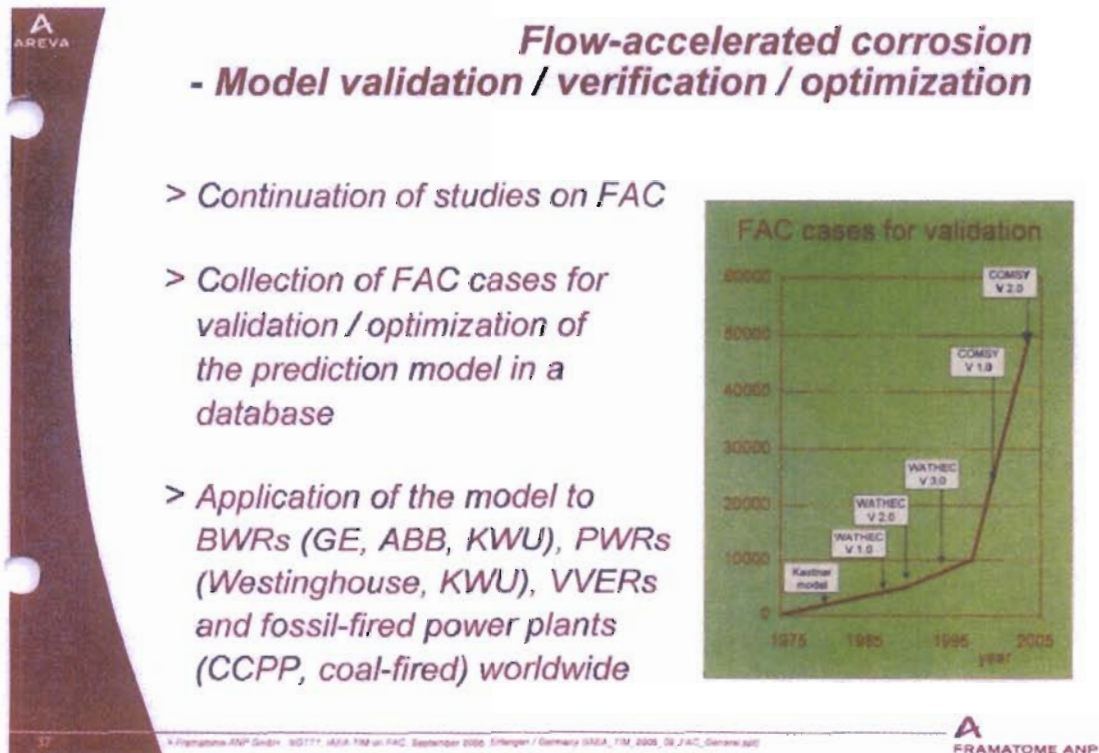


圖 3:管件材質合金含量對管路薄化率之影響

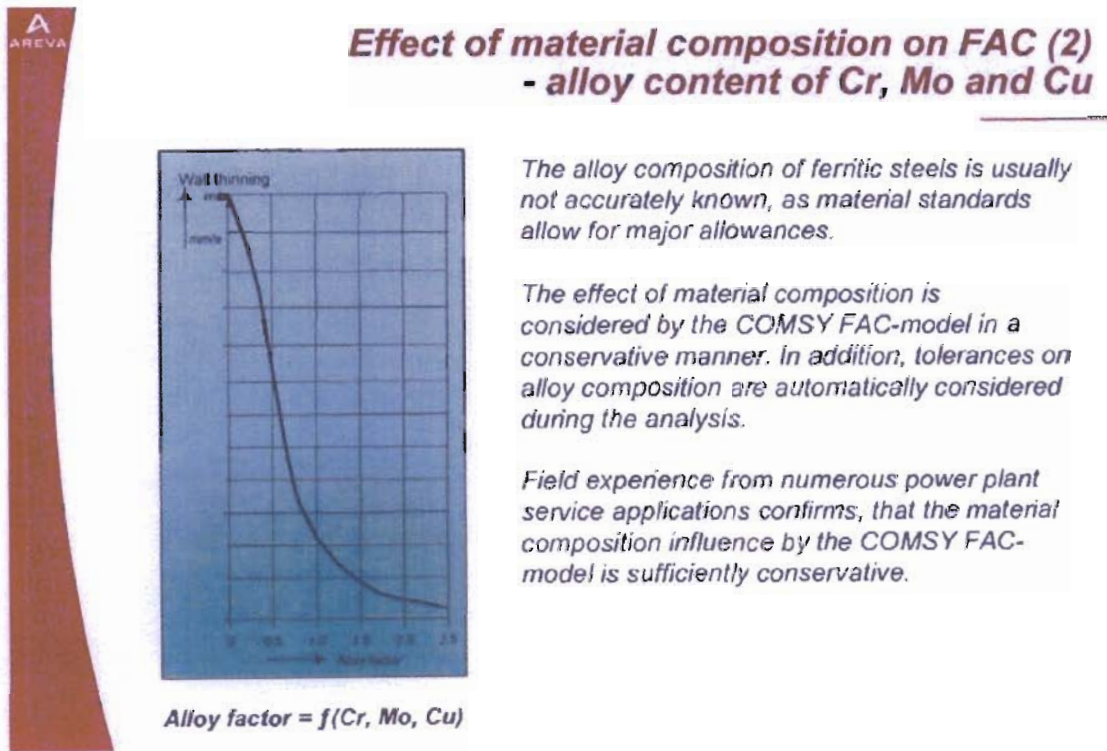


圖 4：pH 值對 FAC 的影響

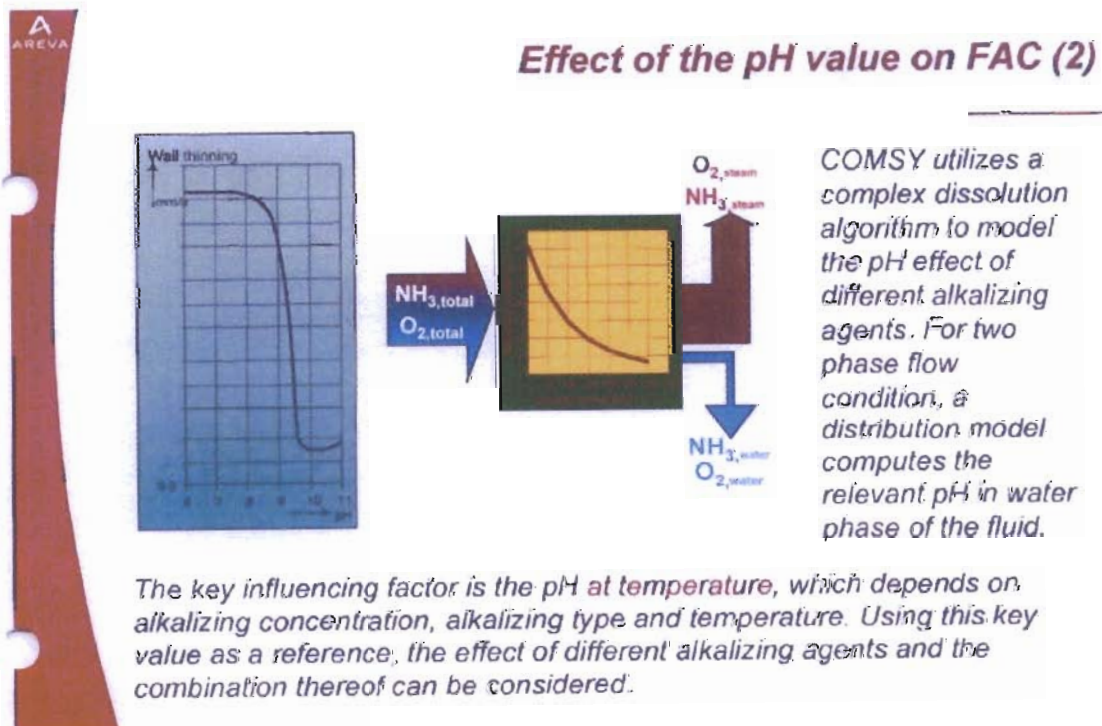


圖 5:水中溶氧量對 FAC 的影響

Flow-accelerated corrosion - Influencing parameters (3)

> *Oxygen concentration*

- highest thinning rates are observed below 10 ppb (parts per billions; µg/kg)
- in the range between 10 and 40 ppb wall thinning is reduced drastically
- above a value of 90 ppb wall thinning can be neglected

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* Framatome ANP GmbH, NDT 11, IAEA-TM on FAC, September 2008, Energie / Germany (IAEA, TM, 2008, 09, FAC, German).ppt

圖 6:溫度對 FAC 的影響

Flow-accelerated corrosion - Influencing parameters (6)

> *Temperature*

- below 40°C and above 260°C thinning rates are low
- highest thinning rates are observed at some 150°C

百分比

溶解度

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* Framatome ANP GmbH, NDT 11, IAEA-TM on FAC, September 2008, Energie / Germany (IAEA, TM, 2008, 09, FAC, German).ppt

圖 7:管件及上游管件對 FAC 的影響

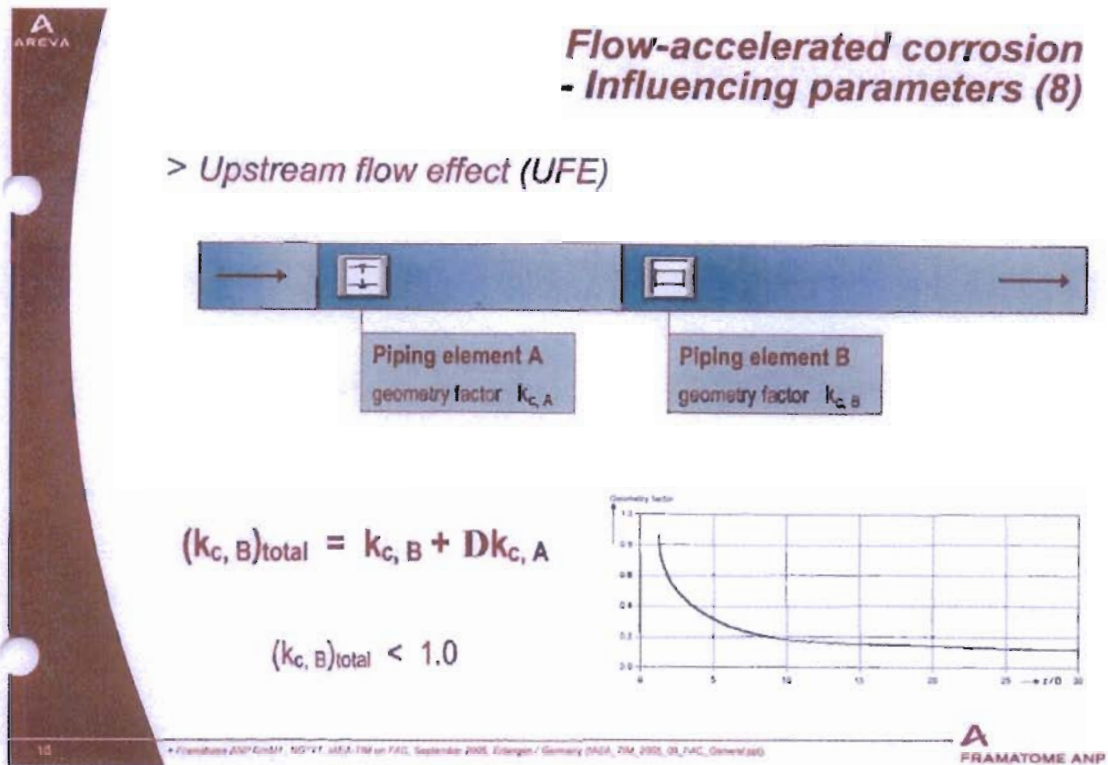


圖 8:管路中雙向流之流譜圖

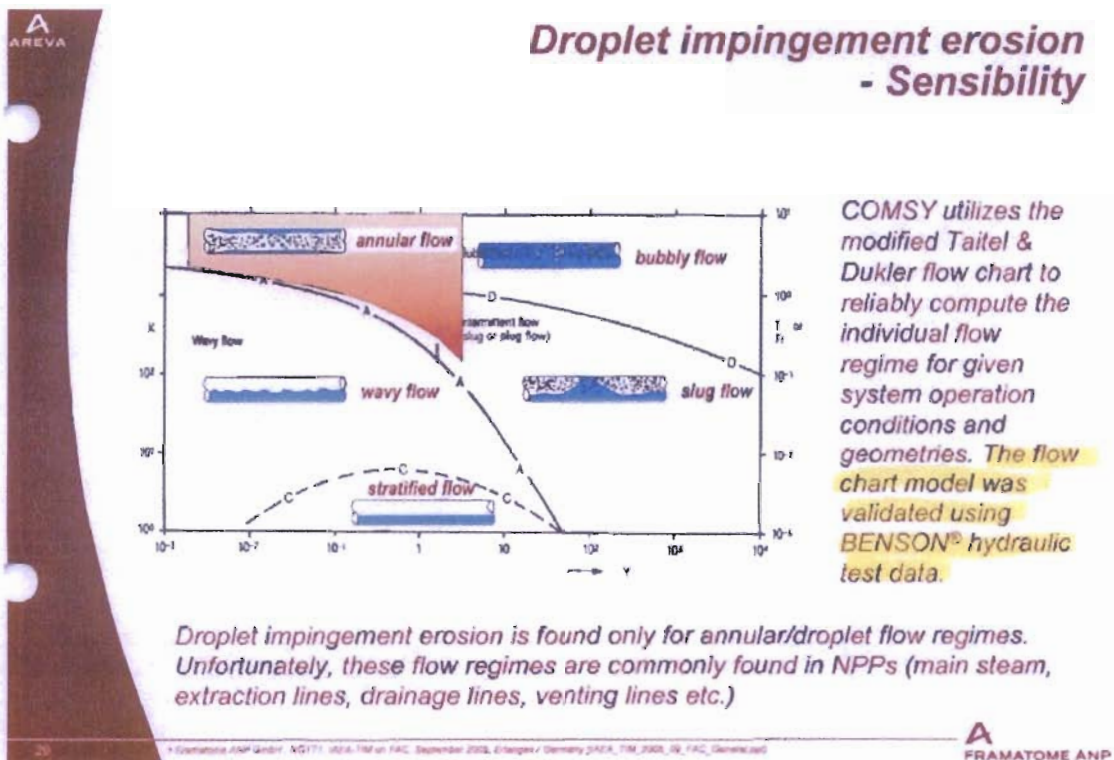


圖 9:COMSY 計算電廠水化學分佈與管路溶氧量之能力驗證

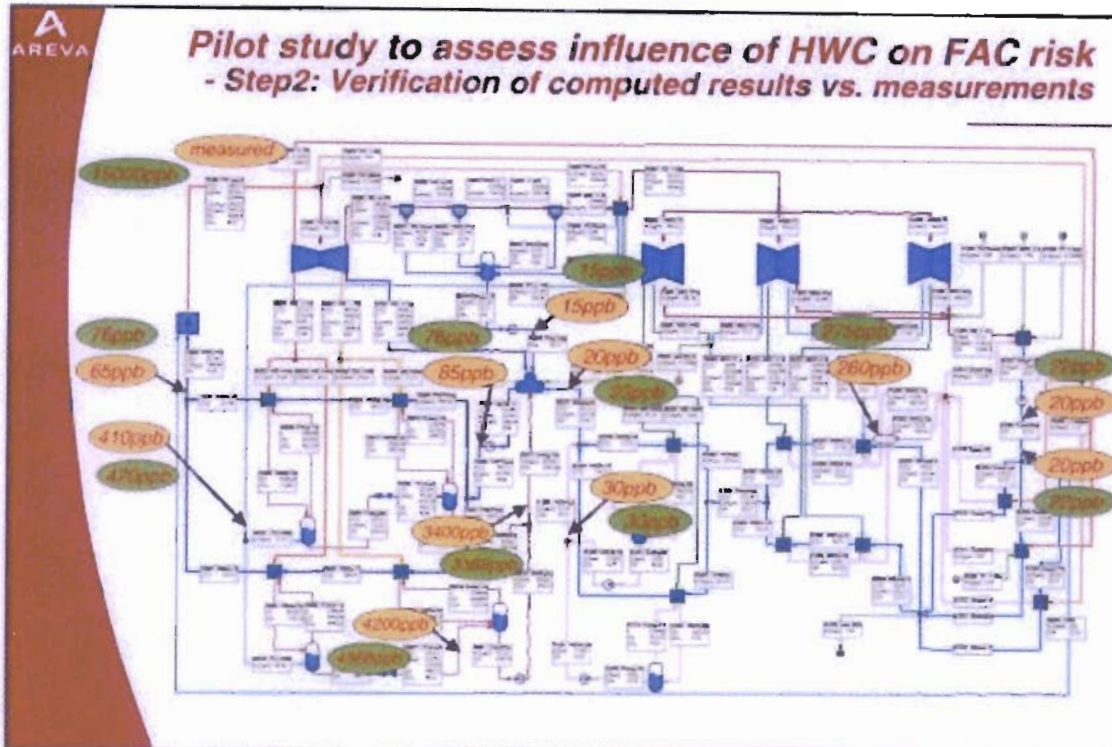


圖 10:利用 COMSY 來評估加氫水化學後之變化

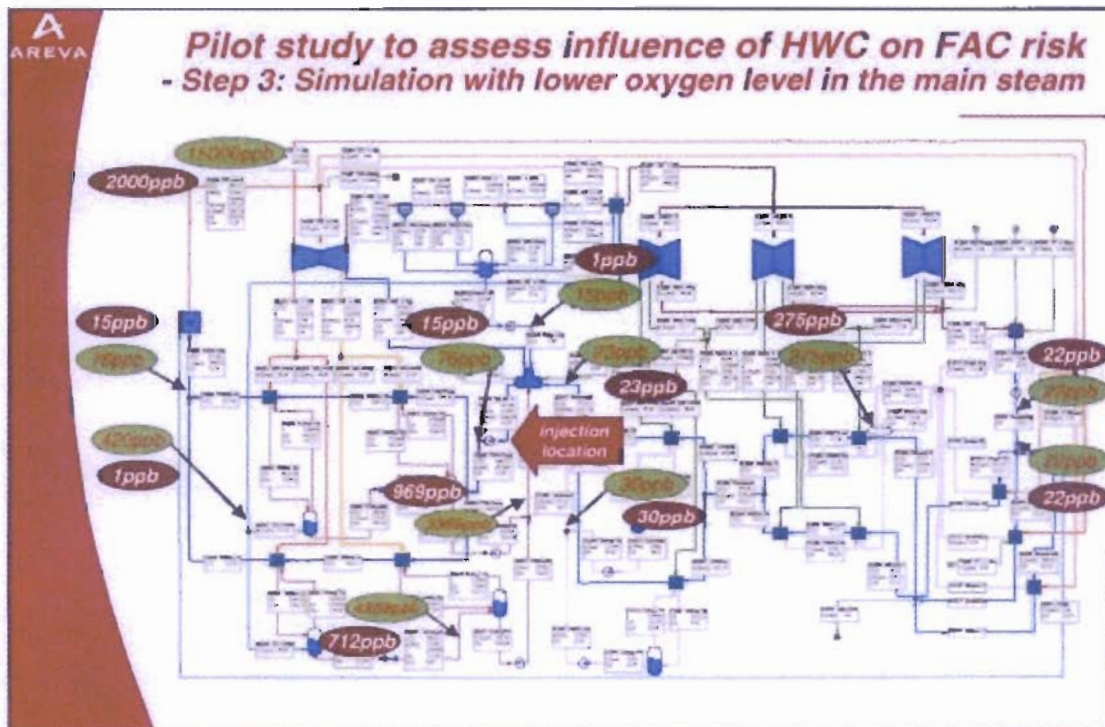


圖 11:COMSY 經檢測數據修正後，可進一步縮小減測數量

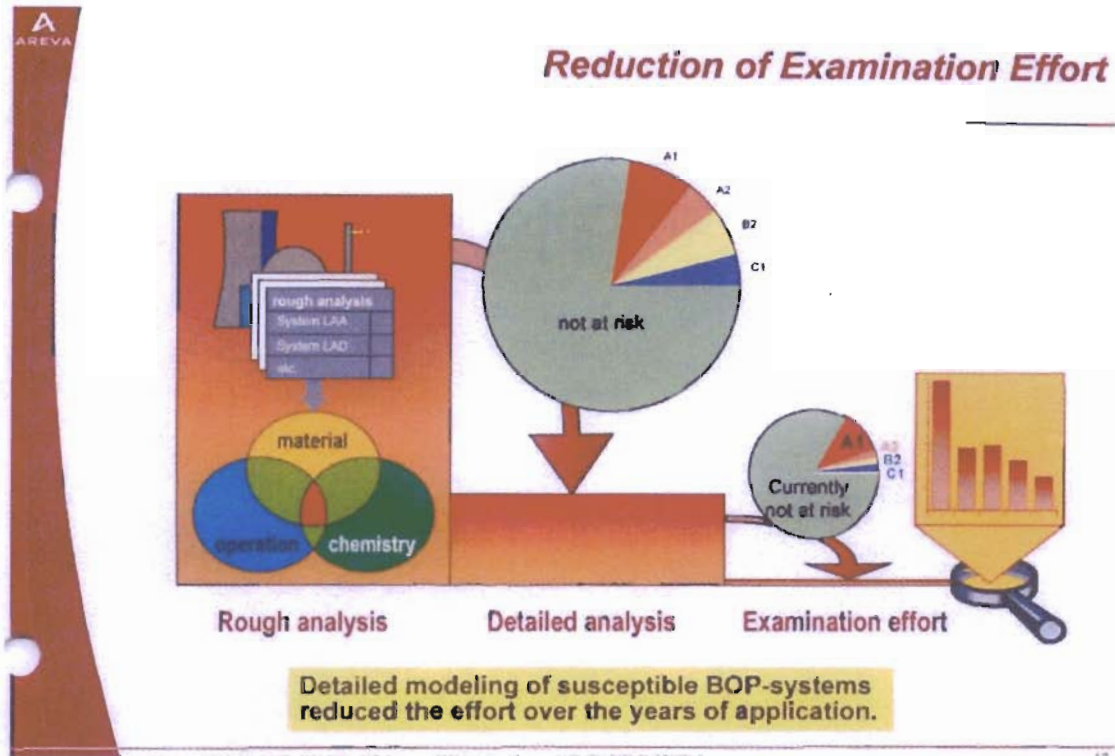


圖 12:COMSY 軟體模擬之安全餘裕

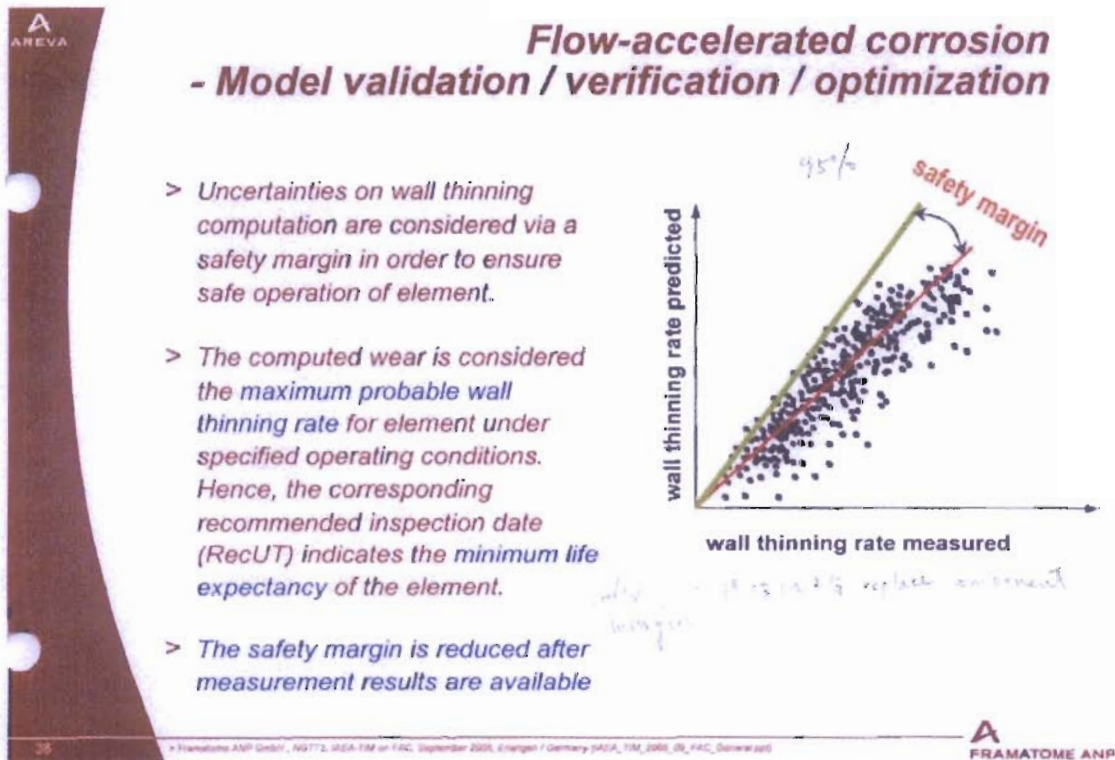


圖 13:COMSY 軟體之管線分析結果，以圖形表示

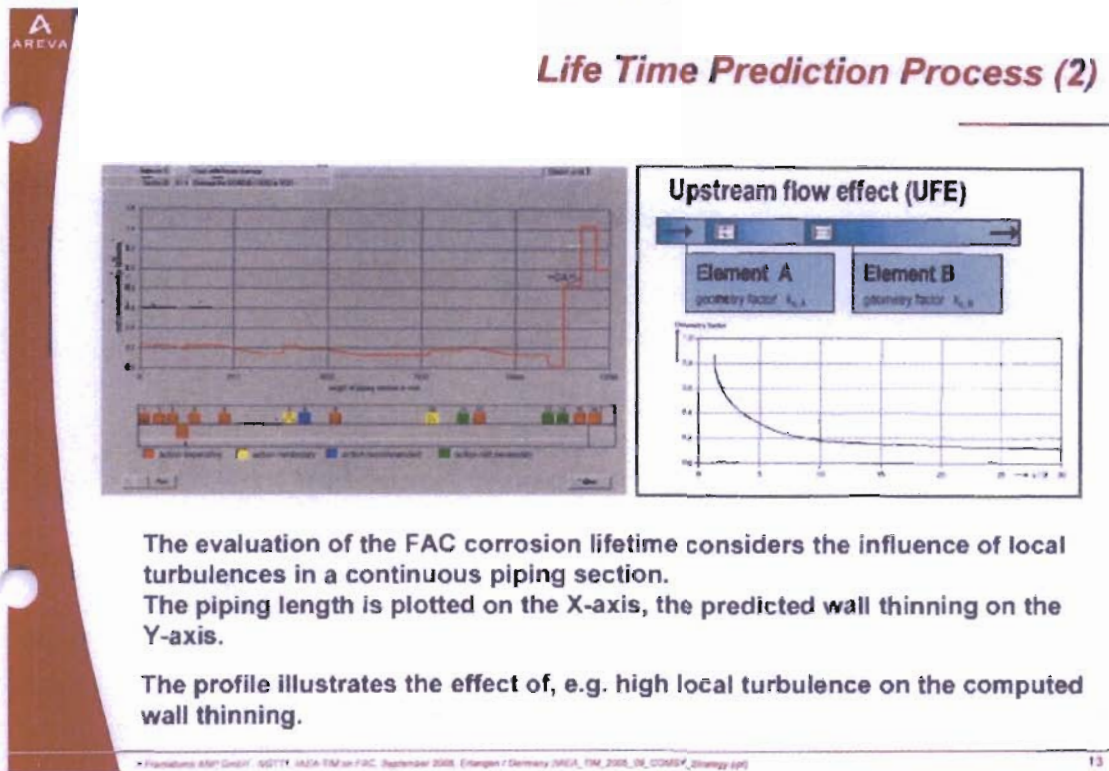


圖 14:管線內之管件檢測建議

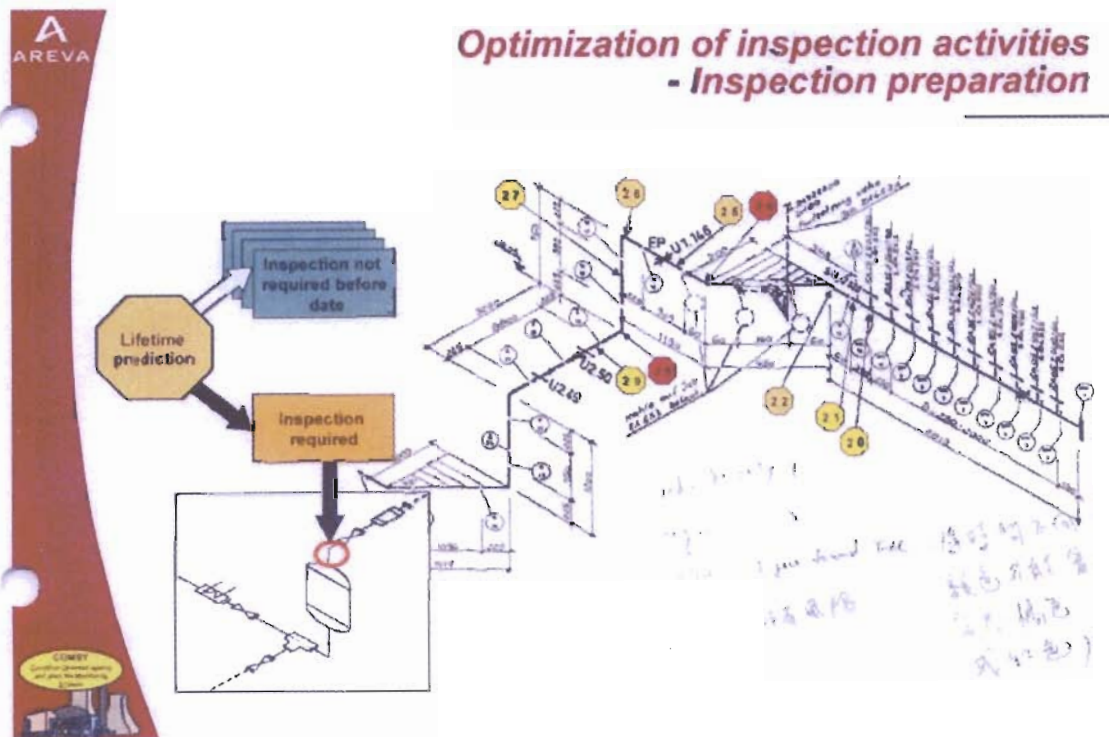


圖 15:KKL 電廠使用 COMSY 後，管件檢測數量有效減少之實例

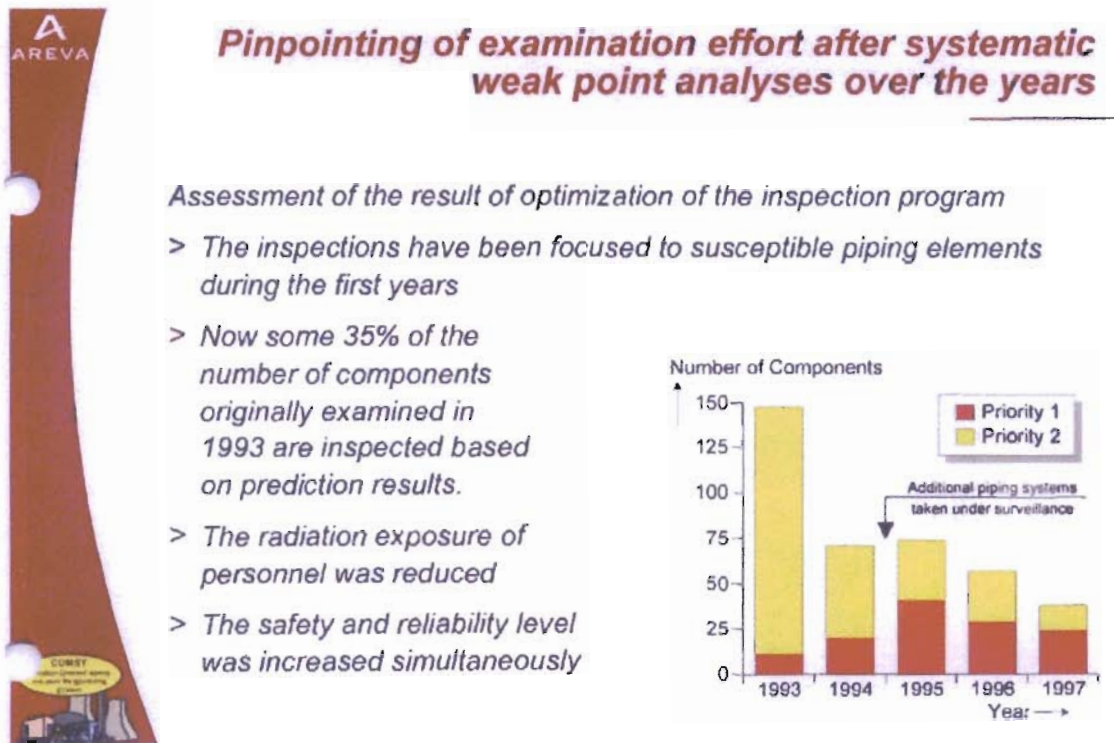


圖 16:KKL 電廠其管件檢測數據與 COMSY 預測值之比較

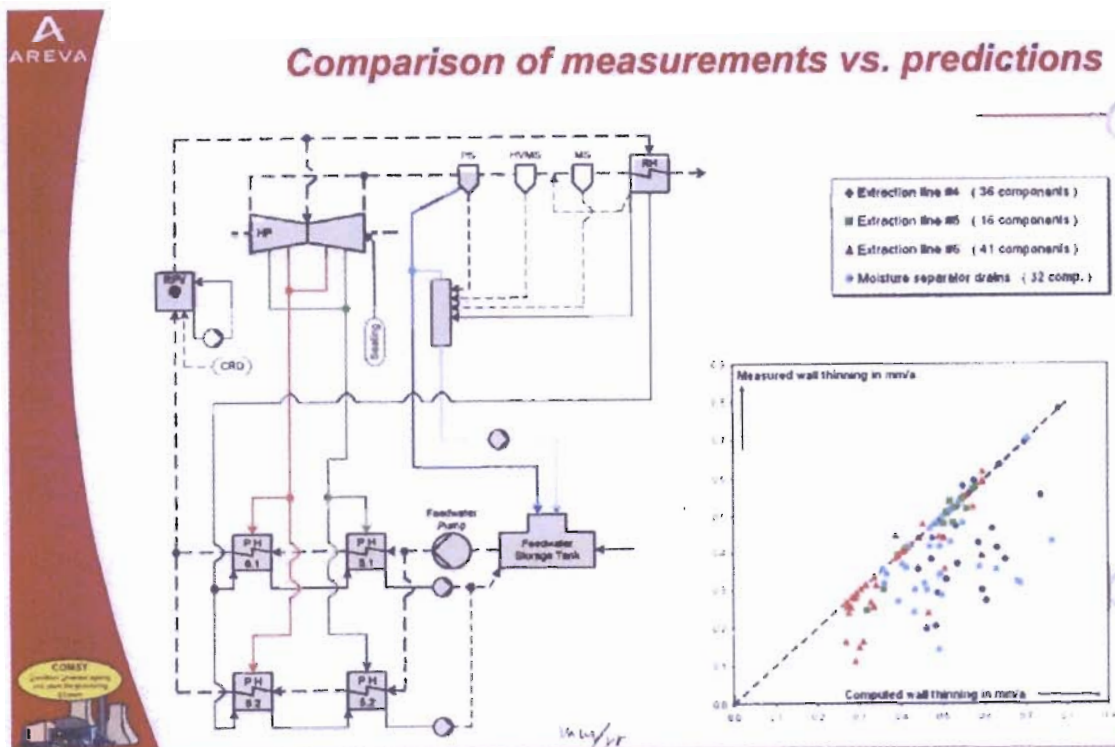


圖 17:NDE 檢測數據以圖形表示

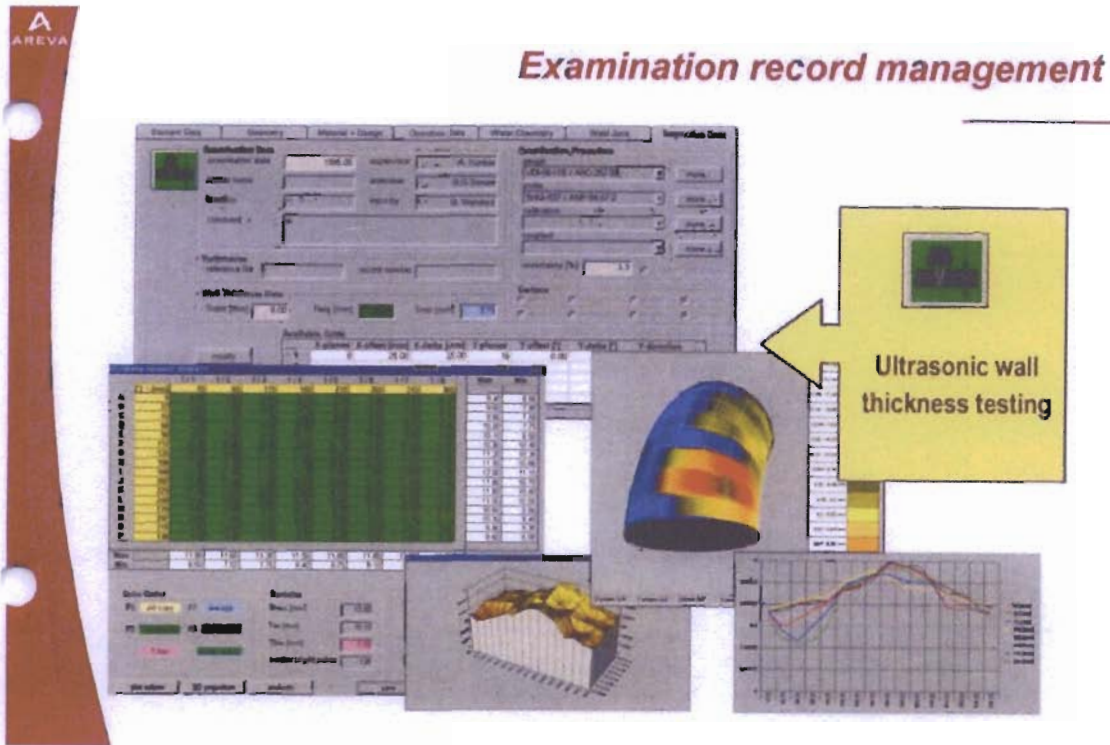
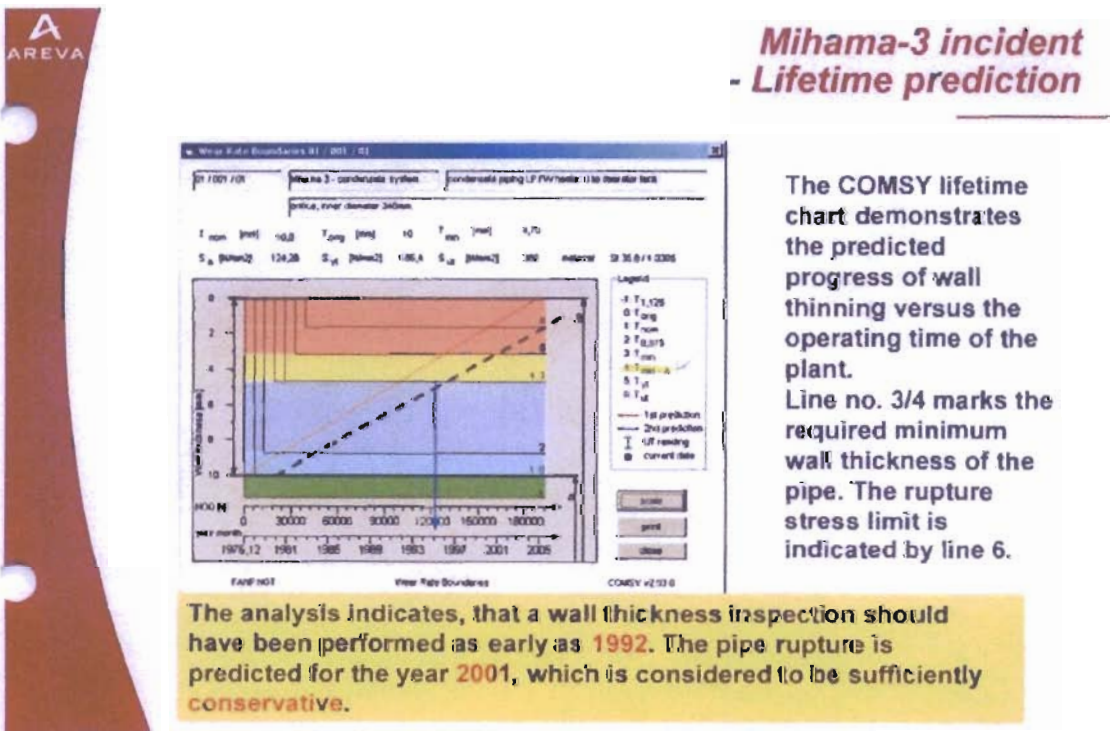


圖 18:COMSY 模擬日本 Mihama-3 事件之結果



附件一:COMSY 技術研討會議程

Letter dated 25. August 2005
to all Participants of the TIM on FAC
Our reference NGTT1/Roe



FAC Technical Information Meeting – Agenda

Monday, 05.09.2005	9:30 - 10:30	Welcome, introduction, overview
	10:30 - 11:30	FAC - History & Current status of knowledge
	11:30 - 11:45	Break
	11:45 - 13:00	FAC – Background & Definitions
	13:00 - 14:00	Lunch
	14:00 - 14:45	Lab tour
	14:45 - 15:00	Break
	15:00 - 16:30	Approaches for FAC assessment
Tuesday, 06.09.2005	9:00 - 10:30	Assessment and discussion of failures reported (Part 1)
	10:30 - 10:45	Break
	10:45 - 12:00	Assessment and discussion of failures reported (Part 2)
	12:00 - 13:00	Lunch
	13:00 - 16:30	Effects of different water chemistry treatments; break included
	19:30	Dinner at a typical Frankonian restaurant
Wednesday, 07.09.2005	9:00 - 10:30	Water chemistry (application example)
	10:30 - 10:45	Break
	10:45 - 12:30	Screening the plant for sensitive system areas (rough analysis)
	12:30 - 13:30	Lunch
	13:30 - 15:00	Lab tour (materials engineering department)
	15:00 - 15:15	Break
	15:15 - 16:30	Detailed analysis of sensitive system areas (Part 1)
Thursday, 08.09.2005	9:00 - 10:00	Detailed analysis of sensitive system areas (Part 2)
	10:00 - 10:15	Break
	10:15 - 12:00	Detailed analysis of sensitive system areas (application example)
	12:00 - 13:00	Lunch
	13:00 - 15:00	Consideration of examinations
	15:00 - 15:15	Break
	15:15 - 16:30	Consideration of examinations (application example)
Friday, 09.09.2005	9:00 - 10:00	Inspection management
	10:00 - 11:00	PLIM & PLEX methodology
	11:00 - 11:15	Break
	11:15 - 12:15	RI-ISI methodology
	12:15 - 13:00	As-is documentation
	13:00 - 14:15	Lunch at the company restaurant "Bierlechstuben"
	14:15 - 15:30	Summary, feedback