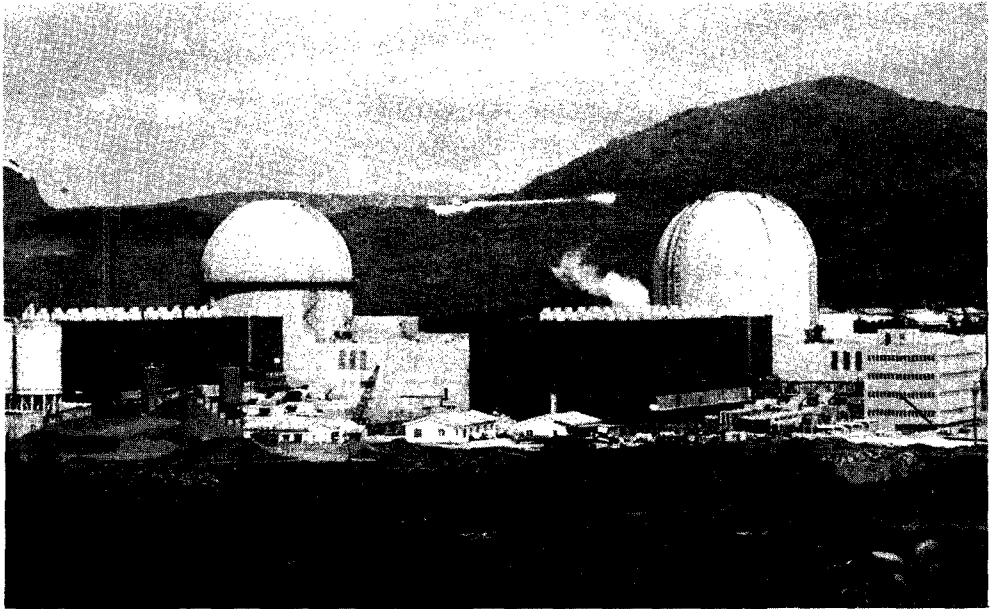


特 輯

# 美國 原子力産業의 現況



●美國 原子力産業의 近況과 展望 ●美國 原子力發電所 現況 ●低出力 運轉許可取得 플랜트(1987年) ●全出力 運轉許可取得 플랜트(1987年) ●商業運轉開始 플랜트(1987年) ●商業運轉 開始 플랜트 增加 추세 ●1986年度 美國 原子力發電所 實績 ●美國 原電의 運轉 補修費 ●美國 原電 運轉性能 3年間 平均

# 美國 原子力産業의 近況과 展望

— AIF 1987年度 中間報告書에서 —

“ 1987年 上半期の 美國原子力産業은 每 45日마다 1基 꼴로 新規 原子力 플랜트를 追加하여 現在 全美國의 電力供給量의 18% 以上을 占有하게 되었다. ”

## 原子力플랜트 建設現況

7月 1日 現在로 美國은 使用許可된 108基의 原子力플랜트를 保有하고 있으며, 이 中 99基는 商業運轉中이다. 나머지 9基中 4基는 全出力運轉許可는 났지만 아직도 商業運轉을 始作하지 않고 있는 것들이며, 5基는 低出力運轉許可만 나 있는 것들이다. 이 原子力플랜트들은 國家別로서는 世界 最大의 原子力프로그램을 代表하고 있는 것이며, 1953年 當時의 美國의 電力需要보다 더 많은 電力을 原子力이 生産하고 있다.

1987年 上半期の 原子力發電量은 2,221億 내지 2,380億 KWH가 될 것으로 豫想되며, 이것은 1986年の 同期間과 比較해 最少限 14%의 伸長을 가져온 셈이다. TVA傘下의 5基의 原子力플랜트의 繼續인 停止, 이 外의 몇 基 플랜트의 失望스러운 實績과 電力이 不足한 롱아일랜드 및 뉴잉글랜드 地方의 Shoreham 및 Seabrook 原子力플랜트에 대한 使用妨害工作이 없었더라면 이 數値는 더 커졌을 것이다.

또한 美國의 原子力占有率은 豫想보다 약간 빨리 伸長하고 있으나 美에너지省의 展望으로

는 1990年末까지는 原子力占有率이 20%에는 미치지 못할 것이라고 한다. 그러나 1987年度 1/4 分期中の 原子力占有率은 18%를 넘었으며 이 값은 1986年度의 16.6%에 比해 記錄의인 것이었다.

한편, 新規 原子力플랜트들이 繼續 活潑하게 系統에 投入되고 있다. 1987年에는 지금까지 每 6.5週에 1基꼴로 新規 플랜트가 成功的으로 完成되고 있으며 이는 TMI事故時의 一時 猶豫期間의 平均 8週에 1基꼴의 新規 플랜트 完成率과는 좋은 對照를 이룬다.

「이와 같은 趨勢가 繼續된다면 1990年까지는 美國의 總發電量의 1/5을 原子力이 차지하게 될 것」이라고 美國原子力産業會議의 Dircks會長은 말하고 「電力源으로써 原子力은 美國의 에너지 構造로 보아 代置될 수 없는 것이며, 自動車와 마찬가지로 美國의 存立을 위해 心須의인 것」이라고 했다.

## OPEC 油價에 미치는 影響

이 모든 原子力의 成長勢는 美國經濟의 繼續的인 伸長勢와 關聯이 있는데 1987年度 上半期

의 電力需要伸長率은 3.7%였다. 이와 同時에 美國에서의 實際 電力原價는 1987年의 첫 5個月間에 利率과 化石燃料價格의 下落으로 1986年의 同期間에 比해 約 7% 떨어졌다.

「美國에서의 新規 原子力의 初期原價는 높겠지만 原子力은 에너지價格의 低減에 큰 몫을 차지할 것」이라고 Dircks 씨는 말하고 「現在 原子力은 全世界적으로 하루에 約 7百萬 바렐의 原油를 恒久的으로 代置하고 있으며, 이는 顧客의 利益을 위해 石油와 其他 化石燃料의 값을 낮추는데 적지 않게 寄與했다」고 했다.

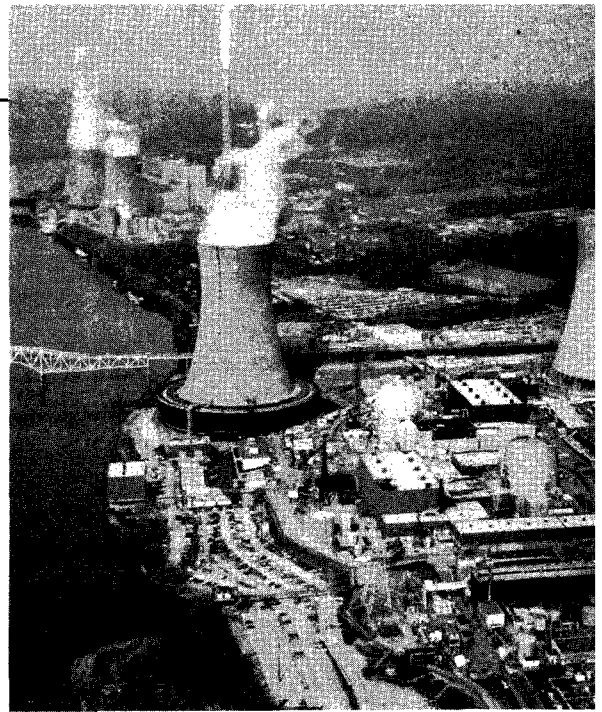
그러나 1次的인 原子力統計資料는 短期展望만을 傳하고 있을 뿐이다. 즉, 이 報告書에는 美國에서 使用許可를 받아야 할 플랜트는 16基뿐이며, 이 中 1基를 除外하고는 모두 折半以上 完成돼 있는 것들이다. 「現在 建設中인 플랜트를 除外하고는 더 以上 美國에는 豫定돼 있는 原子力은 없다」고 Dircks會長은 말하고 「이것은 美國經濟와 에너지確保의 長期的인 健全성을 뜻하는 것은 아니다」라고 했다.

Dircks會長은 美國을 除外한 나머지 工業國家들이 平和的인 原子力開發에 努力하고 있다고 指摘하고 「美國이 앞으로 이 技術分野에서 바이어의 立場으로 轉落할 危險性도 있으며, 原子力의 平和的인 利用은 美國이 창출한 高度의 노우하우이나 이로부터 利得을 取할 수 있는 技術을 다른 國家들에게 提供하게 되는 分野가 될 것이다」라고 했다.

## 將來計劃의 樹立

現在 實施中인 原子力플랜트 建設計劃이 끝난 다음에는 얼마나 빠른 時日內에 美國이 原子力플랜트를 追加建設할 수 있게 될지는 다음 問題의 解決與否에 달려 있다고 본다.

— 安定되고 豫測可能한 國家原子力政策의 樹立. 이러한 政策에 따라 原子力플랜트 所有主들로 하여금 承認받은 仕樣에 따라 플랜트를 짓기



만 하면 運轉이 可能하다는 確信을 갖게끔 한다. 安定된 運轉許可節次는 原子力플랜트의 標準化와 밀접한 關係를 유지하여야 한다. 將來의 原子力原價에 關해 最近 產業界에서 行한 研究結果에 따르면 原子力發電 原價는 原子力플랜트가 8年內에 建設되고 利用率이 65%로만 維持되어도 石炭火力發電 原價보다 平均 10%以上 有利한 것으로 나타났다.

— 州別規制水準에 맞는 實質的인 電力料金の 策定. 많은 電力會社들은 石炭火力이든 原子力이든 新規의 發電所를 建設하는 것을 꺼려왔다. 왜냐 하면 이들 發電所의 建設費用을 電力料金の 調整에 의해 償還할 수 있는 狀況이 아니기 때문이다. Dircks會長은 「一部の 州規制機關들은 電力會社의 電力料金에 대해 아주 甚한 統制를 加하여 需用家들에게 短期的으로는 利益을 주었지만 長期的으로는 이러한 措置로 新規플랜트의 建設을 기피할 것이 分明하므로 需用家들에게 損害를 끼치게 될 것」이라고 말했다.

— 高單位放射性廢棄物處分場의 建設 또는 最少限 이러한 處分場을 安全한 位置에 建設할 수 있다는 國民에 대한 保障. 完成된 原子力플랜

트의 使用許可를 留保하도록 要求하거나 이미稼動中인 플랜트의 廢鎖를 強要하는理由로一部 批判者들은 確固한 放射性廢棄物處分프로그램의 不在를 口實삼는 경우가 있다. 「1982년에 制定된 核廢棄物管理法이 美國에너지省에 의해 法에서 要求하는 대로 完全히 履行되지 않는다면 原子力의 選擇은 恒久的으로 이루어지지 않을지도 모른다」고 Dircks會長은 말했다.

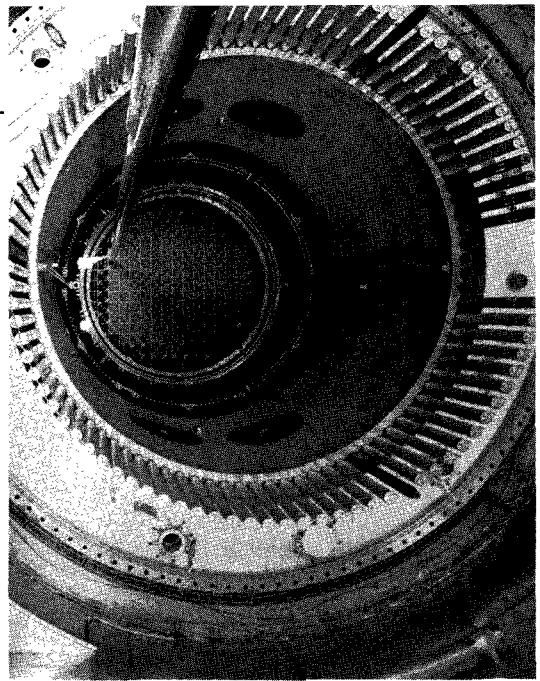
— 既存플랜트의 安全하고 信賴性 있는 運轉이 問題는 全的으로 美國의 原子力플랜트의 所有主와 運轉員들의 責任이며 어느 한 플랜트에서 일어난 事故라도 이것이 報道되어 다른 곳에서 政治的으로 또는 規制上 어려움을 가져오게 된다. 따라서 産業界는 앞으로 10年間 無事故 運轉을 至上目標로 設定했다.

## 産業界의 改編

훌륭한 運轉을 實施하고 國民들에게 이러한 良好한 實績을 認識시키는 것이 美國에서 앞으로 原子力을 增進시키는데 가장 確實한 方法이라는 것을 알고 있으므로 産業界는 今年에 主要한 組織改編을 斷行하려고 하고 있다. 이 改編의 主要骨子は 다음과 같다.

— 1980년에 創設된 「原子力施設管理 및 資源協議會」를 新設되는 「原子力管理 및 資源協議會」(NUMARC)로 改編하고 美國原子力産業會議(AIF) 内の 지금까지 플랜트運轉許可問題를 取扱해왔던 部署를 이 新設 協議會에 統合시킨다. NUMARC는 Byron Lee씨를 會長으로 하여 原子力規制問題를 다루게 된다.

— 美國原子力産業會議(AIF)의 弘報事業과 技術陣容의 一部를 新設되는 美國에너지弘報協議會(U. S. Council for Energy Awareness, 略稱 USCEA)에 統合시킨다. 1980年 創設된 美國에너지弘報委員會(U. S. Committee for Energy Awareness)를 新設되는 USCEA에 統合시키며, 이 委員會의 委員長이었던 Harold



Finger씨가 新設 協議會의 會長으로 留任한다.

— 原子力事業監視委員會(Utility Nuclear Power Oversight Committee)를 原子力監視委員會(Nuclear Power Oversight Committee, 略稱 NPOC)로 改編한다. 이 NPOC는 다른 두 機構 및 美國原子力協議會(ANEC)에 대한 協調機構이고, ANEC는 原子力産業界와 政府間의 協議機構이며 根本的으로는 그대로 存續되는 것이다.

新設되는 USCEA는 從前의 AIF의 弘報機能과 舊 USCEA의 弘報活動을 併合한 것이며 따라서 原子力에 關한 統計業務와 其他 事實의 人 情報의 센터가 될 것이다.

이러한 改編에 따른 理事會와 AIF 會員 加入을 위한 正式投票가 6월에 實施되었으며, 이 그룹들의 實際的인 統合은 今年 後半期에 完了될 豫定이다. 11월에 USCEA와 NUMARC는 新設 事務室을 워싱턴市에 개설할 豫定이다.

Carl Walske 씨는 AIF會長으로 14年以上 在任한 後 지난 6月30日 65歲의 나이로 停年退任했다. 그의 後任으로 William Dircks씨가 就任했으며, Dircks 씨는 또한 來年 1月1日부터 IAEA 本部의 事務次長職도 兼任하게 될 것이다.

# 美國 原子力發電所 現況(1987年 7月1日 現在)

다음 原子力플랜트 一覽表는 州別 알파벳順으로 羅列한 것이며, 表中 建設工事進度欄의 (O)는 發注, (C)는 建設許可取得, (굵은 活字)表示는 運轉許可取得 플랜트를 나타낸다. 電力 會社間 共同所有로 돼 있는 플랜트에 대해서는 各會社의 持分을 會社名 다음에 表示했으며, 1 個 會社名만 있는 경우는 100%所有임을 나타낸다. 플랜트共有會社가 몇 個社 되는 경우에는 第一 먼저 表示된 會社가 該當플랜트의 運營會社이다. MWe容量은 設計定格容量이며, 表中의 (\* )表記는 運轉開始日字가 遲延되고 있는 플랜트이다. 이 表中의 略字表示는 다음과 같다.

## 플랜트設計業體(A/E)

<b>AEPSC</b>	American Electric Power Service Corporation	<b>GILB</b>	Gilbert
<b>BECH</b>	Bechtel	<b>PSE</b>	Pioneer Service & Engineering
<b>B, S&amp;L</b>	Bechtel, Sargent & Lundy	<b>S&amp;L</b>	Sargent & Lundy
<b>B&amp;R</b>	Burns & Roe	<b>SCSI</b>	Southern Company Services, Inc.
<b>B&amp;R, GE</b>	Burns & Roe and General Electric	<b>S&amp;B</b>	Southern Company Services, Inc. & Bechtel
<b>B&amp;R, G</b>	Burns & Roe and Gilbert	<b>S&amp;W</b>	Stone & Webster
<b>EBAS</b>	Ebasco	<b>UE&amp;C</b>	United Engineers & Constructors, Inc.
<b>FPS</b>	Fluor Power Services	<b>UTIL</b>	Utility
<b>G&amp;H</b>	Gibbs & Hill	<b>U&amp;B</b>	Utility and Bechtel
<b>GHD&amp;R</b>	Gibbs, Hill, Durham & Richardson	<b>UT, S&amp;W</b>	Utility and Stone & Webster

## 原子爐 製造業體(Mfr.)

<b>AC</b>	Allis-Chalmers	<b>GA</b>	General Atomic
<b>B&amp;W</b>	Babcock & Wilcox	<b>GE</b>	General Electric
<b>CE</b>	Combustion Engineering	<b>W</b>	Westinghouse

## 原子爐型

<b>BWR</b>	Boiling Water Reactor	<b>HTGR</b>	High Temperature Gas-cooled Reactor
<b>GR</b>	Graphite Reactor	<b>PWR</b>	Pressurized Water Reactor

<u>State, Utility and Ownership</u>	<u>Unit, Status and % Construction Completed</u>	<u>Location</u>	<u>Net MWe</u>	<u>Type/Mfr./AE</u>	<u>Commercial Operation</u>
<b>ALABAMA</b>					
Alabama Power Co.	Joseph M. Farley 1	Houston County	829	PWR/W/S&B	12/77
Alabama Power Co.	Joseph M. Farley 2	Houston County	829	PWR/W/S&B	7/81
Tennessee Valley Authority	Browns Ferry 1	Decatur	1,065	BWR/GE/UTIL	8/74
Tennessee Valley Authority	Browns Ferry 2	Decatur	1,065	BWR/GE/UTIL	3/75
Tennessee Valley Authority	Browns Ferry 3	Decatur	1,065	BWR/GE/UTIL	3/77
Tennessee Valley Authority	Bellefonte 1 (C-85%)	Scottsboro	1,213	PWR/B&W/UTIL	1/94
Tennessee Valley Authority	Bellefonte 2 (C-56%)	Scottsboro	1,213	PWR/B&W/UTIL	1/96
<b>ARIZONA</b>					
Arizona Public Service Co. 29.1% (Salt River Project 17.5%, El Paso Electric Co. 15.8%, Public Service Co. of New Mexico 10.2%, Southern California Edison Co. 15.8%, Southern California Public Power Authority 5.9%, Los Angeles Dept. of Water & Power 5.7%)	Palo Verde 1	Wintersburg	1,270	PWR/CE/BECH	1/86
Arizona Public Service Co. 29.1% (Salt River Project 17.5%, El Paso Electric Co. 15.8%, Public Service Co. of New Mexico 10.2%, Southern California Edison Co. 15.8%, Southern California Public Power Authority 5.9%, Los Angeles Dept. of Water & Power 5.7%)	Palo Verde 2	Wintersburg	1,270	PWR/CE/BECH	9/86
Arizona Public Service Co. 29.1% (Salt River Project 17.5%, El Paso Electric Co. 15.8%, Public Service Co. of New Mexico 10.2%, Southern California Edison Co. 15.8%, Southern California Public Power Authority 5.9%, Los Angeles Dept. of Water & Power 5.7%)	Palo Verde 3	Wintersburg	1,270	PWR/CE/BECH	3 Qtr./87*

<u>State, Utility and Ownership</u>	<u>Unit, Status and % Construction Completed</u>	<u>Location</u>	<u>MWe</u>	<u>Type/Mfr./AE</u>	<u>Commercial Operation</u>
<b>ARKANSAS</b>					
Arkansas Power & Light Co.	Arkansas Nuclear One—1	Russellville	850	PWR/B&W/BECH	12/74
Arkansas Power & Light Co.	Arkansas Nuclear One—2	Russellville	912	PWR/CE/BECH	3/80
<b>CALIFORNIA</b>					
Pacific Gas and Electric Co.	Diablo Canyon 1	Avila Beach	1,084	PWR/W/UTIL	5/85
Pacific Gas and Electric Co.	Diablo Canyon 2	Avila Beach	1,106	PWR/W/UTIL	3/86
Sacramento Municipal Utility District	Rancho Seco 1	Herald	918	PWR/B&W/BECH	4/75
Southern California Edison Co. 80% (San Diego Gas and Electric Co. 20%)	San Onofre 1	San Clemente	436	PWR/W/BECH	1/68
Southern California Edison Co. 75% (San Diego Gas and Electric Co. 20%, Riverside Public Utilities 1.8%, Anaheim Electrical Division 3.2%)	San Onofre 2	San Clemente	1,070	PWR/CE/BECH	8/83
Southern California Edison Co. 75% (San Diego Gas and Electric Co. 20%, Riverside Public Utilities 1.8%, Anaheim Electrical Division 3.2%)	San Onofre 3	San Clemente	1,080	PWR/CE/BECH	4/84
<b>COLORADO</b>					
Public Service Company of Colorado	Fort St. Vrain	Platteville	330	HTGR/GA/S&L	1/79
<b>CONNECTICUT</b>					
Connecticut Yankee Atomic Power Co. (Consisting of: Northeast Utilities (Connecticut Light and Power Co. 34.5%, Western Massachusetts Electric Co. 9.5%), New England Power Co. 15%, Boston Edison Co. 9.5%, United Illuminating Co. 9.5%, Central Maine Power Co. 6%, Public Service Co. of New Hampshire 5%, Cambridge Electric Light Co. 4.5%, Montaup Electric Co. 4.5%, Central Vermont Public Service Corp. 2%)	Haddam Neck	Haddam Neck	582	PWR/W/S&W	1/68
Northeast Utilities (Connecticut Light and Power Co. 81%, Western Massachusetts Electric Co. 19%)	Millstone 1	Waterford	660	BWR/GE/EBAS	12/70
Northeast Utilities (Connecticut Light and Power Co. 81%, Western Massachusetts Electric Co. 19%)	Millstone 2	Waterford	870	PWR/CE/BECH	12/75
Northeast Utilities (Connecticut Light and Power Co. 52.9%, Western Massachusetts Electric Co. 12.2%), New England Power Co. 12.2%, Montaup Electric Co. 4%, Public Service Co. of New Hampshire 2.8%, United Illuminating Co. 3.7%, Massachusetts Municipal Wholesale Electric Co. 4.8%, Central Maine Power Co. 2.5%, Central Vermont Public Service Corp. 1.7%, Others 3.2%)	Millstone 3	Waterford	1,150	PWR/W/S&W	4/86
<b>FLORIDA</b>					
Florida Power Corp. 90% (Seminole Electric Coop. 1.7%, Orlando Utilities Commission 1.6%, Others 6.7%)	Crystal River 3	Crystal River	850	PWR/B&W/GILB	3/77
Florida Power & Light Co.	Turkey Point 3	Turkey Point	666	PWR/W/BECH	12/72
Florida Power & Light Co.	Turkey Point 4	Turkey Point	666	PWR/W/BECH	9/73
Florida Power & Light Co.	St. Lucie 1	St. Lucie County	839	PWR/CE/EBAS	12/76
Florida Power & Light Co. 85.1% (Florida Municipal Power Agency 8.8%, Orlando Utilities Commission 6.1%)	St. Lucie 2	St. Lucie County	839	PWR/CE/EBAS	8/83
<b>GEORGIA</b>					
Georgia Power Co. 50.1% (Oglethorpe Power Corp. 30%, Municipal Electric Authority of Georgia 17.7%, City of Dalton 2.2%)	Edwin I. Hatch 1	Baxley	775	BWR/GE/S&B *	12/75
Georgia Power Co. 50.1% (Oglethorpe Power Corp. 30%, Municipal Electric Authority of Georgia 17.7%, City of Dalton 2.2%)	Edwin I. Hatch 2	Baxley	781	BWR/GE/S&B	9/79
Georgia Power Co. 45.7% (Oglethorpe Power Corp. 30%, Municipal Electric Authority of Georgia 22.7%, City of Dalton 1.6%)	Alvin W. Vogtle 1	Waynesboro	1,122	PWR/W/BECH	6/87*

<u>State, Utility and Ownership</u>	<u>Unit, Status and % Construction Completed</u>	<u>Location</u>	<u>MWe</u>	<u>Type/Mfr./AE</u>	<u>Commercial Operation</u>
Georgia Power Co. 45.7% (Oglethorpe Power Corp. 30%, Municipal Electric Authority of Georgia 22.7%, City of Dalton 1.6%)	Alvin W Vogtle 2 (C-64%)	Waynesboro	1,122	PWR/W/BECH	9/88
<b>ILLINOIS</b>					
Commonwealth Edison Co.	Dresden 2	Morris	794	BWR/GE/S&L	8/70
Commonwealth Edison Co.	Dresden 3	Morris	794	BWR/GE/S&L	10/71
Commonwealth Edison Co.	Zion 1	Zion	1,040	PWR/W/S&L	10/73
Commonwealth Edison Co.	Zion 2	Zion	1,040	PWR/W/S&L	9/74
Commonwealth Edison Co. 75% (Iowa-Illinois Gas and Electric Co. 25%)	Quad Cities 1	Cordova	789	BWR/GE/S&L	8/72
Commonwealth Edison Co. 75% (Iowa-Illinois Gas and Electric Co. 25%)	Quad Cities 2	Cordova	789	BWR/GE/S&L	10/72
Commonwealth Edison Co.	LaSalle 1	Seneca	1,078	BWR/GE/S&L	1/84
Commonwealth Edison Co.	LaSalle 2	Seneca	1,078	BWR/GE/S&L	10/84
Commonwealth Edison Co.	Braidwood 1	Braidwood	1,120	PWR/W/S&L	9/87
Commonwealth Edison Co.	Braidwood 2 (C-71%)	Braidwood	1,120	PWR/W/S&L	10/88
Commonwealth Edison Co.	Byron 1	Byron	1,120	PWR/W/S&L	9/85
Commonwealth Edison Co.	Byron 2	Byron	1,120	PWR/W/S&L	0/87
Commonwealth Edison Co.	Carroll County 1 (O)	Savanna	1,120	PWR/W/-	*
Commonwealth Edison Co.	Carroll County 2 (O)	Savanna	1,120	PWR/W/-	*
Illinois Power Co. 86% (Soyland Power Coop. and Western Illinois Power Coop. 14%)	Clinton 1	Clinton	933	BWR/GE/S&L	4 Qtr./87
<b>IOWA</b>					
Iowa Electric Light and Power Co. 70% (Central Iowa Power Coop. 20%, Corn Belt Power Coop. 10%)	Duane Arnold	Palo	565	BWR/GE/BECH	2/75
<b>KANSAS</b>					
Kansas Gas and Electric Co. 47% (Kansas City Power & Light Co. 47%, Kansas Electric Power Coop. 6%)	Wolf Creek	Burlington	1,150	PWR/W/B,S&L	9/85
<b>LOUISIANA</b>					
Gulf States Utilities Co. 70% (Cajun Electric Power Coop. 30%)	River Bend 1	St. Francisville	940	BWR/GE/S&W	6/86
Louisiana Power & Light Co.	Waterford 3-	Taft	1,104	PWR/CE/EBAS	9/85
<b>MAINE</b>					
Maine Yankee Atomic Power Co. (Consisting of: Central Maine Power Co. 38%, New England Power Co. 20%, Northeast Utilities (Connecticut Light and Power Co. 12%, Western Massachusetts Electric Co. 3%), Bangor Hydro-Electric Co. 7%, Maine Public Service Co. 5%, Public Service Co. of New Hampshire 5%, Cambridge Electric Light Co. 4%, Montaup Electric Co. 4%, Central Vermont Public Service Corp. 2%)	Maine Yankee	Wiscasset	825	PWR/CE/S&W	12/72
<b>MARYLAND</b>					
Baltimore Gas and Electric Co.	Calvert Cliffs 1	Lusby	825	PWR/CE/BECH	5/75
Baltimore Gas and Electric Co.	Calvert Cliffs 2	Lusby	825	PWR/CE/BECH	4/77
<b>MASSACHUSETTS</b>					
Boston Edison Co.	Pilgrim 1	Plymouth	670	BWR/GE/BECH	12/72
Yankee Atomic Electric Co. (Consisting of: Northeast Utilities (Connecticut Light and Power Co. 24.5%, Western Massachusetts Electric Co. 7%), New England Power Co. 30%, Boston Edison Co. 9.5%, Central Maine Power Co. 9.5%, Public Service Co. of New Hampshire 7%, Montaup Electric Co. 4.5%, Central Vermont Public Service Corp. 3.5%, Commonwealth Electric Co. 2.5%, Cambridge Electric Light Co. 2%)	Yankee	Rowe	175	PWR/W/S&W	7/61
<b>MICHIGAN</b>					
Consumers Power Co.	Big Rock Point	Charlevoix	69	BWR/GE/BECH	11/65
Consumers Power Co.	Palisades	Covert	777	PWR/CE/BECH	12/71

<u>State, Utility and Ownership</u>	<u>Unit, Status and % Construction Completed</u>	<u>Location</u>	<u>MWe</u>	<u>Type/Mfr./AE</u>	<u>Commercial Operation</u>
Detroit Edison Co. 87% (Wolverine Power Supply, Inc. 13%)	Fermi 2	Newport	1,100	BWR/GE/UTIL	9/87
Indiana & Michigan Electric Co. Indiana & Michigan Electric Co.	Donald C. Cook 1 Donald C. Cook 2	Bridgman Bridgman	1,030 1,100	PWR/W/AEPSC PWR/W/AEPSC	8/75 7/78
<b>MINNESOTA</b>					
Northern States Power Co. Northern States Power Co. Northern States Power Co.	Monticello Prairie Island 1 Prairie Island 2	Monticello Red Wing Red Wing	545 530 530	BWR/GE/BECH PWR/W/FPS PWR/W/FPS	6/71 12/73 12/74
<b>MISSISSIPPI</b>					
System Energy Resources, Inc. 90% (South Mississippi Electric Power Assoc. 10%)	Grand Gulf 1	Port Gibson	1,250	BWR/GE/BECH	7/85
System Energy Resources, Inc. 90% (South Mississippi Electric Power Assoc. 10%)	Grand Gulf 2 (C-33%)	Port Gibson	1,250	BWR/GE/BECH	
<b>MISSOURI</b>					
Union Electric Co.	Callaway	Callaway County	1,120	PWR/W/BECH	12/84
<b>NEBRASKA</b>					
Nebraska Public Power District Omaha Public Power District	Cooper Fort Calhoun 1	Brownville Fort Calhoun	760 492	BWR/GE/B&R PWR/CE/GHD&R	7/74 9/73
<b>NEW HAMPSHIRE</b>					
Public Service Co. of New Hampshire 35.6% (United Illuminating Co. 17.5%, Eastern Utilities Associates 12.1%, Massachusetts Municipal Wholesale Electric Co. 11.6%, New England Power Co. 9.9%, Connecticut Light and Power Co. 4%, Canal Electric Co. 3.5%, Montaup Electric Co. 2.9%, New Hampshire Electric Coop. 2.2%, Others 0.7%)	Seabrook 1 (C-100%)	Seabrook	1,150	PWR/W/UE&C	1 Qtr./88
<b>NEW JERSEY</b>					
GPU Nuclear Corp. (Jersey Central Power & Light Co. 100%)	Oyster Creek	Lacey Township	650	BWR/GE/B&R,GE	12/69
Public Service Electric and Gas Co. 42.6% (Philadelphia Electric Co. 42.6%, Atlantic Electric Co. 7.4%, Delmarva Power & Light Co. 7.4%)	Salem 1	Lower Alloways Creek Township	1,106	PWR/W/UTIL	6/77
Public Service Electric and Gas Co. 42.6% (Philadelphia Electric Co. 42.6%, Atlantic Electric Co. 7.4%, Delmarva Power & Light Co. 7.4%)	Salem 2	Lower Alloways Creek Township	1,106	PWR/W/UTIL	10/81
Public Service Electric and Gas Co. 95% (Atlantic Electric Co. 5%)	Hope Creek 1	Lower Alloways Creek Township	1,067	BWR/GE/BECH	12/86
<b>NEW YORK</b>					
Consolidated Edison Co. of New York, Inc. New York Power Authority New York Power Authority Long Island Lighting Co. Niagara Mohawk Power Corp. Niagara Mohawk Power Corp. 41% (Long Island Lighting Co. 18%, New York State Electric & Gas Corp. 18%, Rochester Gas and Electric Co. 14%, Central Hudson Gas & Electric Corp. 9%) Rochester Gas and Electric Corp.	Indian Point 2 Indian Point 3 James A. FitzPatrick Shoreham Nine Mile Point 1 Nine Mile Point 2	Buchanan Buchanan Scriba Brookhaven Scriba Scriba	873 965 816 809 610 1,080	PWR/W/UE&C PWR/W/UE&C BWR/GE/S&W BWR/GE/S&W BWR/GE/UTIL BWR/GE/S&W	8/73 8/76 7/75 — 12/69 1/88
Robert E. Ginna	Robert E. Ginna	Rochester	470	PWR/W/GILB	7/70
<b>NORTH CAROLINA</b>					
Carolina Power & Light Co. 81.7% (North Carolina Eastern Municipal Power Agency 18.3%)	Brunswick 1	Southport	821	BWR/GE/UE&C	3/77
Carolina Power & Light Co. 81.7% (North Carolina Eastern Municipal Power Agency 18.3%)	Brunswick 2	Southport	821	BWR/GE/UE&C	11/75
Carolina Power & Light Co. 83.8% (North Carolina Eastern Municipal Power Agency 16.2%)	Shearon Harris 1	New Hill	900	PWR/W/EBAS	5/87
Duke Power Company Duke Power Company	William McGuire 1 William McGuire 2	Cornelius Cornelius	1,150 1,150	PWR/W/UTIL PWR/W/UTIL	12/81 3/84



<u>State, Utility and Ownership</u>	<u>Unit, Status and % Construction Completed</u>	<u>Location</u>	<u>MWe</u>	<u>Type/Mfr./AE</u>	<u>Commercial Operation</u>
<b>OHIO</b>					
Central Area Power Coordination Group (CAPCO) [Cleveland Electric Illuminating Co. 31.1% (operating utility), Ohio Edison Co. 30.0%, Toledo Edison Co. 19.9%, Duquesne Light Co. 13.8%, Pennsylvania Power Co. 5.2%]	Perry 1	North Perry	1,205	BWR/GE/GILB	3 Qtr./87
Central Area Power Coordination Group (CAPCO) [Cleveland Electric Illuminating Co. 31.1% (operating utility), Ohio Edison Co. 30.0%, Toledo Edison Co. 19.9%, Duquesne Light Co. 13.8%, Pennsylvania Power Co. 5.2%]	Perry 2 (C-57%)	North Perry	1,205	BWR/GE/GILB	0/00 <sup>a</sup>
Central Area Power Coordination Group (CAPCO) [Toledo Edison Co. 48.6% (operating utility), Cleveland Electric Illuminating Co. 51.4%]	Davis-Besse 1	Oak Harbor	860	PWR/B&W/BECH	11/77
<b>OREGON</b>					
Portland General Electric Co. 67.5% (Eugene Water & Electric Board 30%, Pacific Power & Light Co. 2.5%)	Trojan	Rainier	1,130	PWR/W/BECH	5/76
<b>PENNSYLVANIA</b>					
Central Area Power Coordination Group (CAPCO) [Duquesne Light Co. 47.5% (operating utility), Ohio Edison Co. 35%, Pennsylvania Power Co. 17.5%]	Beaver Valley 1	Shippingport	833	PWR/W/UT,S&W	10/76
Central Area Power Coordination Group (CAPCO) [Duquesne Light Co. 13.7% (operating utility), Ohio Edison Co. 41.9%, Cleveland Electric Illuminating Co. 24.5%, Toledo Edison Co. 19.9%]	Beaver Valley 2	Shippingport	836	PWR/W/UT,S&W	9/87
GPU Nuclear Corp. (Metropolitan Edison Co. 50%, Jersey Central Power & Light Co. 25%, Pennsylvania Electric Co. 25%)	Three Mile Island 1	Londonderry Township	819	PWR/B&W/GILB	9/74
GPU Nuclear Corp. (Metropolitan Edison Co. 50% Jersey Central Power & Light Co. 25%, Pennsylvania Electric Co. 25%)	Three Mile Island 2	Londonderry Township	900	PWR/B&W/B&R	12/78
Pennsylvania Power & Light Co. 90% (Allegheny Electric Coop. 10%)	Susquehanna 1	Berwick	1,050	BWR/GE/BECH	6/83
Pennsylvania Power & Light Co. 90% (Allegheny Electric Coop. 10%)	Susquehanna 2	Berwick	1,050	BWR/GE/BECH	2/85
Philadelphia Electric Co. 42.5% (Public Service Electric and Gas Co. 42.5%, Atlantic City Electric Co. 7.5%, Delmarva Power & Light Co. 7.5%)	Peach Bottom 2	Peach Bottom Township	1,065	BWR/GE/BECH	7/74
Philadelphia Electric Co. 42.5% (Public Service Electric and Gas Co., 42.5%, Atlantic City Electric Co. 7.5%, Delmarva Power & Light Co. 7.5%)	Peach Bottom 3	Peach Bottom Township	1,065	BWR/GE/BECH	12/74
Philadelphia Electric Co.	Limerick 1	Limerick Township	1,055	BWR/GE/BECH	2/86
Philadelphia Electric Co.	Limerick 2 (C-55%)	Limerick Township	1,055	BWR/GE/BECH	4 Qtr./90
<b>SOUTH CAROLINA</b>					
Carolina Power & Light Co.	H.B. Robinson 2	Hartsville	700	PWR/W/EBAS	3/71
Duke Power Company	Oconee 1	Seneca	860	PWR/B&W/U&B	7/73
Duke Power Company	Oconee 2	Seneca	860	PWR/B&W/U&B	9/74
Duke Power Company	Oconee 3	Seneca	860	PWR/B&W/U&B	12/74
Duke Power Company 25% (North Carolina Electric Membership Corp. 56.2%, Saluda River Electric Coop. 18.8%)	Catawba 1	Clover	1,145	PWR/W/UTIL	6/85
Duke Power Company (North Carolina Municipal Power Agency No. 1 75%, Piedmont Municipal Power Agency 25%)	Catawba 2	Clover	1,145	PWR/W/UTIL	8/86
South Carolina Electric & Gas Co. 67% (South Carolina Public Service Authority 33%)	Summer 1	Jenkinsville	885	PWR/W/GILB	1/84
<b>TENNESSEE</b>					
Tennessee Valley Authority	Sequoyah 1	Daisy	1,148	PWR/W/UTIL	7/81
Tennessee Valley Authority	Sequoyah 2	Daisy	1,148	PWR/W/UTIL	6/82
Tennessee Valley Authority	Watts Bar 1 (C-100%)	Spring City	1,177	PWR/W/UTIL	—
Tennessee Valley Authority	Watts Bar 2 (C-84%)	Spring City	1,177	PWR/W/UTIL	—

<u>State, Utility and Ownership</u>	<u>Unit, Status and % Construction Completed</u>	<u>Location</u>	<u>MWe</u>	<u>Type/Mfr./AE</u>	<u>Commercial Operation</u>
<b>TEXAS</b>					
South Texas Project (Houston Lighting & Power Co. 30.8% (project manager), City Public Service Board of San Antonio 28%, Central Power and Light Co. 25.2%, City of Austin 16%)	South Texas Project 1 (C-99%)	Matagorda County	1,250	PWR/W/BECH	12/87
South Texas Project (Houston Lighting & Power Co. 30.8% (project manager), City Public Service Board of San Antonio 28%, Central Power and Light Co. 25.2%, City of Austin 16%)	South Texas Project 2 (C-75%)	Matagorda County	1,250	PWR/W/BECH	6/89
Texas Utilities Electric Co. 87.8% (Texas Municipal Power Agency 6.2%, Brazos Electric Power Coop. 3.8%, Tex-La Electric Coop. of Texas 2.2%)	Comanche Peak 1 (C-99%)	Somervell County	1,150	PWR/W/G&H	1 Qtr./89
Texas Utilities Electric Co. 87.8% (Texas Municipal Power Agency 6.2%, Brazos Electric Power Coop. 3.8%, Tex-La Electric Coop. of Texas 2.2%)	Comanche Peak 2 (C-83%)	Somervell County	1,150	PWR/W/G&H	3 Qtr./89
<b>VERMONT</b>					
Vermont Yankee Nuclear Power Corp. [Consisting of: Central Vermont Public Service Corp. 31.3%, Green Mountain Power Corp. 17.9%, New England Power Co. 20%, Northeast Utilities (Connecticut Light and Power Co. 9.5%, Western Massachusetts Electric Co. 2.5%), Central Maine Power Co. 4%, Public Service Co. of New Hampshire 4%, Burlington Electric Light Co. 3.6%, Cambridge Electric Light Co. 2.5%, Montaup Electric Co. 2.5%, Others 2.2%]	Vermont Yankee	Vernon	528	BWR/GE/EBAS	11/72
<b>VIRGINIA</b>					
Virginia Power	Surry 1	Surry	781	PWR/W/S&W	12/72
Virginia Power	Surry 2	Surry	781	PWR/W/S&W	5/73
Virginia Power 88.4% (Old Dominion Electric Coop. 11.6%)	North Anna 1	Mineral	926	PWR/W/S&W	6/78
Virginia Power 88.4% (Old Dominion Electric Coop. 11.6%)	North Anna 2	Mineral	926	PWR/W/S&W	12/80
<b>WASHINGTON</b>					
U.S. Department of Energy (Steam purchased by Washington Public Power Supply System)	Hanford - N	Richland	860	GR/GE/B&R	9/66
Washington Public Power Supply System	WPPSS 1 (C-63%)	Richland	1,250	PWR/B&W/UE&C	•
Washington Public Power Supply System	WPPSS 2	Richland	1,100	BWR/GE/B&R	12/84
Washington Public Power Supply System 70% (Pacific Power & Light Co. 10%, Portland General Electric Co. 10%, Puget Sound Power and Light Co. 5%, Washington Water Power Co. 5%)	WPPSS 3 (C-76%)	Satsop	1,240	PWR/CE/EBAS	•
<b>WISCONSIN</b>					
Dairyland Power Coop.	LaCrosse	Genoa	50	BWR/AC/S&L	11/69
Wisconsin Electric Power Co.	Point Beach 1	Two Creeks	485	PWR/W/BECH	12/70
Wisconsin Electric Power Co.	Point Beach 2	Two Creeks	485	PWR/W/BECH	10/72
Wisconsin Public Service Corp. 41.2% (Wisconsin Power and Light Co. 41%, Madison Gas and Electric Co. 17.8%)	Kewaunee	Carlton Township	535	PWR/W/PSE	6/74

## 低出力 運轉許可取得플랜트(1987年)

Unit	Location	MWe	Type/Mfr./AE	Utility	License Issued
Vogtle 1	Waynesboro, GA	1,122	PWR/W/Bech	Georgia Power	1/87
Palo Verde 3	Wintersburg, AZ	1,270	PWR/CE/Bech	Arizona Public Service	3/87
Braidwood 1	Braidwood, IL	1,120	PWR/W/S&L	Commonwealth Edison	5/87
Beaver Valley 2	Shippingport, PA	836	PWR/W/UT,S&W	Duquesne Light	5/87

Total: 4 reactors = 4,348 MWe

## 全出力運轉許可取得플랜트 (1987年)

Unit	Location	MWe	Type/Mfr./AE	Utility	License Issued
Shearon Harris 1	New Hill, NC	900	PWR/W/EBAS	Carolina Power & Light	1/87
Byron 2	Byron, IL	1,120	PWR/W/S&L	Commonwealth Edison	1/87
Vogtle 1	Waynesboro, GA	1,122	PWR/W/Bech	Georgia Power	3/87
Clinton 1	Clinton, IL	933	BWR/GE/S&L	Illinois Power	4/87

Total: 4 reactors = 4,075 MWe

## 商業運轉開始플랜트 (1987年)

Unit	Location	MWe	Type/Mfr./AE	Utility	Commercial Operation
Shearon Harris 1	New Hill, NC	900	PWR/W/EBAS	Carolina Power & Light	5/87
Vogtle 1	Waynesboro, GA	1,122	PWR/W/Bech	Georgia Power	6/87

Total: 2 reactors = 2,022 MWe

## 商業運轉開始플랜트 增加趨勢

End of Year	Additions per year		Cumulative	
	No. of Units	Net MWe	No. of Units	Net MWe
1986	8	9,003	98	84,401
1987	10	10,856	107	95,207
1988	4	4,472	111	99,679
1989	3	3,550	114	103,229
1990	1	1,055		104,284
... and beyond	11	12,774	126	117,058

## 美國 商業用發電爐 現況 1987年7月1日

運轉中 108基 <sup>(1)</sup> .....	95,846MWe <sup>(2)</sup>
建設中 16基 <sup>(3)</sup> .....	18,972MWe
注文中 2基 <sup>(4)</sup> .....	2,240MWe
計 126基	117,058MWe

(1) 이 중에서 商業運轉 중인 유니트가 99基(86,373MWe). 全出力運轉許可는 取得했으나 아직 商業運轉하지 않고 있는 유니트가 4基(Fermi 2-1, 100MWe, Perry 1-2, 205MWe, Byron 2-1, 120MWe, Clinton 1-933MWe). 低出力運轉許可를 取得한 유니트가 5基(Shoreham-809MWe, Palo Verde 3-1, 270MWe, Beaver Valley 2-836MWe, Nine Mille Point Two-1, 080MWe, Braidwood 1-1, 120MWe). 또한 LaCrosse 유니트-50MWe BWR은 無期限 停止中이나 運轉許可는 그대로 持續되고 있음.

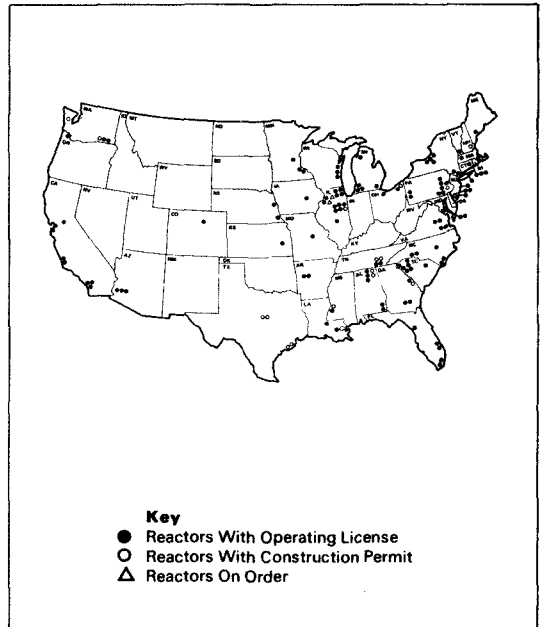
(2) 運轉 중인 모든 發電爐의 設備容量이며, 1987年 4月 現在의 美國 全體發電設備容量(714,351MWe)의 13.4%에 該當됨. 1987年의 첫 4個月間의 總原子力發電量은 1,470億KWh였으며, 이는 美國의 總發電量의 12.2%에 該當됨.

(3) 建設 중인 原子爐의 工事進度: 0基=1~24%, 1基=25~100%. Seabrook 1號機(1,150MWe)는 100%工事完了 되어 燃料裝填認可까지 받았으나, 運轉許可가 아직 나지 않아 建設 중인 플랜트數에 包含시켰음. 이 중에는 運轉開始日字가 未定인 3基(WPPSS1& 3-2, 490MWe-各63%, 76%完工, Grand Gulf 2-1, 250MWe-33%完工)도 包含돼 있음.

(4) 發注 중인 2基는 Carroll County 1, 2號機로 運轉開始日字 未定임.

(備考) 現在까지의 美國의 商業用發電爐의 運轉實績累計는 1,080爐·年이며, 全世界의 累計는 4,400爐·年임.

## 原子力 플랜트 分布現況 (1987年7月1日)



# 1986年度 美國 原子力發電所 實績



最低發電原價를 記錄한 10位以內의 플랜트들은 平均利用率이 78.46% 였으며, 平均發電費用이 1億 425萬弗이었다. 이 플랜트들은 大體的으로 1986년에 燃料再裝填停止期間이 없었고 또한 不時停止時間이 延長되는 것도 避했던 플랜트들이다.



Maine Yankee Atomic Power 社의 Maine Yankee 플랜트는 利用率이 13% 急上昇하여 總發電費에서 1千1百萬弗의 節減을 가져와 發電原價 9.665mills/KWH를 記錄함으로써 1986年度 美國內에서 가장 發電原價가 낮은 플랜트가 되었다.

이 플랜트外에 1986年度에 最低發電原價 플랜트 10位圈內에 새로 들어온 플랜트는 Calvert Cliffs, Zion, St. Lucie 등 3個 플랜트이다. 이 10位圈內에 들은 나머지 6個 플랜트는 1985年度부터 繼續해서 10位圈內에 머물러 있는 플랜트들로서 North Anna, Point Beach, Callaway, Prairie Island, Trojan, Nine Mile Point 플랜트들이며, 10位圈內의 플랜트들을 메이커別로 보면 WH社 6基, CE社 3基, GE社 1基이다.

1984, 1985, 1986年 3年間을 平均했을때 第1位는 Callaway 플랜트인데, 이 플랜트는 核燃料供給과 關聯된 訴訟에서 勝訴함으로써 燃料費를 減少시킬 수 있었기 때문에 10位안에 들 수 있었던 플랜트로서 이러한 일이 없었더라면 圈內에 들지 못했을 것이다. 이러한 訴訟關係로 因한 利得 없이 가장 效率이 높았던 플랜트는 Virginia Power 社의 North Anna 플랜트였으나, 反面에 이 會社의 Surry 플랜트는 15位였다. North Anna 플

랜트 다음으로 12mills/KWH未滿의 3年平均 發電原價를 記錄한 플랜트는 Prairie Island, Zion, Nine Mile Point-1號 플랜트가 全部이며, Main Yankee 플랜트는 平均 12.057mills/KWH 였다.

別添 1986年度 發電原價對比表는 各原子力發電會社로 부터 美聯邦에너지規利委員會(FERC)에 報告된 實發電量, 運轉補修費, 燃料費, 總發電費用을 土臺로 作成된 것이다.

最低發電原價를 記錄한 10位以內의 플랜트들은 平均利用率이 78.46%였으며, 平均發電費用이 1億425萬弗이었다. 이 플랜트들은 大體的으로 1986년에 燃料再裝填停止期間이 없었고 또한 不時停止時間이 延長되는 것도 避했던 플랜트들이다. 그러나 各會社의 關聯者들은 最低發電原價를 가져온 要因으로 이것 外에 훌륭한 補修, 原價節減, 幸運 등을 들었다.

둘째번 對比表는 今年에 처음으로 作成한 것으로 過去 3年間의 經濟性, 生産性, 規制上의 性能 등에 關한 數值의 平均値를 나타낸 것이다. 이 表에 따르면 過去 3年間 最低平均發電原價를 나타낸 22個 플랜트中 18個 플랜트가 同期間中의 NRC의 플랜트 性能評價에서도 平均 以上이었던 것을 알 수 있다.

## 美國 原電の 運轉補修費 (1986年度)

Utility	Plant	Ven- dor	1986										1984-86	
			Net MW MDC	Net MWH Genera- tion	Capa- city Factor (%)	Mainte- nance Cost (\$)	Mills/ KWH Maint.	Operating costs w/o fuel (\$)	Mills/ KWH w/o fuel	Total Operating Cost (\$)	Mills/ KWH Total	Average Mills/ KWH		
Maine Yankee Atomic Pow.	Maine Yankee	CE	810	6,241,756	87.97	3,708,721	0.594	21,439,059	3.435	60,328,634	9.665	12.057		
Virginia Power	North Anna	W	1,850	12,332,788	76.10	33,657,394	2.729	71,432,003	5.792	132,805,132	10.768	11.072		
Wisconsin Electric Power	Point Beach	W	970	7,185,182	84.56	17,408,920	2.423	43,126,155	6.002	83,960,213	11.685	12.834		
Baltimore G&E	Calvert Cliffs	CE	1,650	12,827,653	88.75	24,245,359	1.890	72,908,489	5.684	150,183,599	11.708	12.308		
Commonwealth Edison	Zion	W	2,080	12,239,103	67.17	16,864,206	1.378	70,774,038	5.783	146,106,090	11.938	11.869		
Union Electric	Callaway	W	1,120	7,170,229	73.08	30,479,504	4.251	85,233,360	11.887	186,600,778	12.078e	9.966a, e		
Northern States Power	Pririe Island	W	1,003	7,679,683	87.41	19,816,035	2.580	49,548,665	6.452	93,262,319	12.144	11.539		
Florida P&L	St. Lucie	CE	1,664	12,198,407	83.68	30,321,348	2.486	67,048,116	5.496	156,868,665	12.890	13.930		
Portland Gen. Electric	Trojan	W	1,050	7,090,231	77.08	18,785,805	2.649	52,017,107	7.336	91,547,857	12.912	13.822		
Niagara Mohawk Power	Nine Mile Point-1	GE	610	3,146,883	58.89	8,216,505	2.611	19,693,118	6.258	40,849,520	12.981	11.990		
Wisconsin Public Serv.	Kewaunee	W	503	3,854,674	87.48	9,696,867	2.516	32,603,672	8.458	53,079,687	13.770	13.879		
Duke Power	Oconee	BW	2,580	16,650,166	73.67	72,335,855	4.344	135,342,499	8.129	240,613,155	14.451	13.217		
Commonwealth Edison	Quad Cities	GE	1,538	9,054,661	67.21	20,962,097	2.315	70,656,203	7.803	131,696,761	14.545	13.958		
Northern States Power	Monticello	GE	536	3,375,350	71.89	9,219,439	2.731	36,337,402	10.766	51,827,187	15.355	13.562f		
Rochester G&E	Genoa	W	470	3,603,116	87.51	10,981,690	3.048	37,389,012	10.377	56,136,261	15.580	15.089		
South Carolina E&G	Sumner	W	885	7,122,239	91.87	20,110,166	2.824	59,534,334	8.359	111,618,848	15.672	19.690		
N. Y. Power Authority	Fitzparick	GE	796	6,015,605	86.27	15,113,290	2.512	54,596,665	9.076	95,061,008	15.802	18.492		
Northeast Utilities	Millstone-3	W	1,149	5,877,348	84.24	7,687,549	1.308	33,910,912	5.770	93,228,047	15.862	15.862b		
Virginia Power	Surry	W	1,562	8,987,569	65.68	45,393,272	5.051	85,515,164	9.515	144,692,405	16.099	13.978		
Commonwealth Edison	Byron-1	W	1,129	7,396,003	74.78	11,018,961	1.490	55,512,511	7.506	119,380,798	16.141	19.672a		
Kansas Gas & Electric	Wolf Creek	W	1,128	6,949,842	70.33	23,818,938	3.427	67,480,579	9.710	114,181,651	16.429	14.265a		
Phila. Electric	Limerick-1	GE	1,055	6,848,745	70.11	12,630,924	1.844	48,687,443	7.109	113,683,142	16.599	16.599b		
Alabama Power	Farley	W	1,656	11,686,488	80.56	53,021,072	4.537	106,147,953	9.083	194,573,738	16.649	15.792		
Carolina P&L	Robinson-2	W	665	4,798,026	82.36	21,710,205	4.525	57,675,695	12.021	81,925,233	17.075	17.509f		
Omaha Public Power	Fort Calhoun	CE	478	3,605,567	86.11	6,986,206	1.938	35,767,162	9.920	62,175,893	17.244	17.037		
Commonwealth Edison	LaSalle	GE	2,072	7,735,131	42.62	27,677,832	3.578	30,416,692	10.396	134,953,106	17.447	16.141		
Indiana & Michigan Elec.	Cook	W	2,080	10,985,641	60.29	31,771,177	2.892	101,293,822	9.221	192,481,642	17.521	17.506		
N. Y. Power Authority	Indian Point-3	W	930	5,262,345	67.83	29,598,560	5.356	56,857,353	10.288	97,648,816	17.670	20.151		
Arkansas P&L	Arkansas Nuclear One	BW	1,694	8,878,704	59.83	33,446,296	3.767	94,483,677	10.642	162,508,102	18.303	16.687		
Duke Power	McGuire	W	2,300	11,374,541	58.45	75,654,742	6.651	136,992,265	12.044	212,577,397	18.601	15.224		
GPU Nuclear	Three Mile Island-1	BW	776	4,808,849	70.74	21,137,774	4.396	72,750,620	15.128	90,597,138	18.840	53.670f		
Penna. Power & Light	Susquehanna	GE	2,064	11,278,508	62.38	44,063,828	3.907	131,372,616	11.648	218,644,944	19.386	18.904		
Northeast Utilities	Millstone-1	GE	654	5,252,328	91.68	11,931,113	2.272	45,640,666	8.690	102,106,708	19.440	19.760		
Carolina P&L	Brunswick	GE	1,580	7,256,291	52.43	27,271,795	3.758	101,482,345	13.985	142,871,849	19.689	24.041		
Iowa Electric L&P	Duane Arnold	GE	515	2,993,335	66.35	8,282,040	2.767	35,463,263	11.847	59,836,867	19.990	26.858		
Commonwealth Edison	Dresden	GE	1,545	6,100,756	45.08	23,081,817	3.783	82,639,309	13.546	123,006,668	20.163	17.160		
Public Service E&G	Salem	W	2,185	12,409,721	64.83	76,044,203	6.128	163,334,656	13.162	253,746,093	20.447	28.698		
Pacific Gas & Electric	Diablo Canyon	W	2,146	11,841,761	62.99	32,770,494	2.767	135,794,533	11.467	242,697,849	20.495	17.103a		
WPPSS	WNP-2	GE	1,095	4,363,364	45.49	21,383,728	4.901	67,358,063	15.437	91,992,207	21.083	21.162a		
Louisiana P&L	Waterford-3	CE	1,104	7,301,595	75.50	37,509,673	5.137	88,118,047	12.068	160,621,869	21.998	18.488a		
Duke Power	Catawba	W	2,290	6,479,694	49.08	40,023,072	6.177	92,610,032	14.292	145,128,400	22.397	20.494a		
Northeast Utilities	Millstone-2	CE	857	5,178,972	68.99	30,124,545	5.812	66,155,755	12.774	116,165,998	22.430	26.922f		
Phila. Electric	Peach Bottom	GE	2,086	11,745,900	64.28	59,397,141	5.057	152,559,129	12.988	264,730,362	22.538	27.520		
Nebraska Public Power	Cooper	GE	764	4,054,302	60.58	N/A		66,538,000	16.412	92,909,000	22.916	18.313g		
Yankee Atomic Power	Yankee	W	167	1,392,721	95.20	1,715,769	1.232	21,811,001	15.661	34,054,315	24.452	32.900		
Duquesne Light Co.	Beaver Valley-1	W	810	4,808,314	67.76	23,716,051	4.932	71,702,394	14.912	123,503,143	25.685	23.060		
Arizona NPP	Palo Verde- 2	CE	2,442	9,151,155	47.32	47,992,784	5.244	153,564,924	16.781	239,794,636	26.204	26.204b		
Southern Calif. Edison	San Onofre	W	2,586	14,054,336	62.04	108,501,187	7.791	210,381,656	14.969	375,737,494	26.735	38.105		
Florida P&L	Turkey Point-3, 4	W	1,332	6,274,909	53.78	75,604,845	12.049	118,338,464	18.859	178,773,912	28.490	18.438		
Consolidated Edison	Indian Point-2	W	864	3,793,526	50.12	37,317,939	9.837	89,014,675	23.465	114,163,830	30.094	27.332		
Vermont Yankee	Vermont Yankee	GE	504	2,058,426	46.62	17,269,653	8.390	52,025,878	25.275	67,491,116	32.788	24.856		
Consumers Power Co.	Big Rock Point	GE	69	505,740	83.67	2,712,162	5.363	12,105,454	23.936	16,940,637	33.497	39.491		
Florida Power Corp.	Crystal River-3	BW	821	2,668,126	37.10	39,483,370	14.798	72,718,122	27.254	89,597,919	33.581	27.944		
Georgia Power Co.	Hatch	GE	1,545	7,240,047	53.49	116,459,405	16.085	189,602,429	26.188	255,547,387	35.296	29.654		
Gulf States Utilities	River Bend	GE	936	3,045,861	68.13	23,471,241	7.706	66,341,097	21.781	112,721,947	37.008	37.008b		
System Energy Resources	Grand Gulf-1	GE	1,108	4,055,750	41.79	35,334,478	8.712	108,495,968	26.751	158,717,278	39.134	38.589a		
Northeast Utilities	Connecticut Yankee	W	569	2,132,318	42.78	36,874,079	17.293	81,713,686	38.322	103,490,349	48.534	30.952		
Dairyland Power Coop.	LaCrosse	AC	48	157,179	37.38	1,023,155	6.509	5,744,151	36.545	8,657,004	55.077	(d)		
Boston Edison	Pilgrim	GE	670	1,027,531	17.51	19,541,802	19.018	72,031,117	70.101	82,859,137	80.639	49.789f		
Consumers Power	Palisades	CE	730	789,956	12.35	26,215,307	33.186	65,672,359	83.134	71,991,839	91.134	64.485		
GPU Nuclear	Oyster Creek	CE	620	1,299,311	23.92	60,643,935	46.674	122,574,016	94.338	130,420,940	100.377	66.363f		
<b>UNITS WITH TOO LITTLE GENERATION TO CALCULATE MILLS/KWH :</b>														
Colorado Public Service	Fort St. Vrain	G A	330	57,023	1.97	29,203,359	(c)	54,495,085	(c)	54,507,709.	(c)	(c)		
Tenn. Valley Authority	Squoyah	W	2,296	0	0.00	52,485,147	(c)	122,014,672	(c)	N/A	(c)	14.335h		
Tenn. Valley Authority	Browns Ferry	GE	3,195	0	0.00	59,274,180	(c)	143,268,062	(c)	N/A	(c)	22.110h		
Toledo Edison	Davis-Besse	BW	860	24,050	0.32	37,350,331	(c)	107,076,635	(c)	115,192,489	(c)	23.516h		
Sacramento MUD	Rancho Seco	BW	873	0.00	0.00	34,740,891	(c)	88,927,226	(c)	89,285,632	(c)	39.733h		
<b>AVERAGE :</b>														
							6.199	16.591	24.362	22.806				

**Footnotes :**

- (a) Not in commercial service in 1984
- (b) Not in commercial service in 1984 and 1985
- (c) Too little generation to derive a meaningful number
- (d) Previous year figures not available
- (e) Callaway costs would total \$149, 743, 549 and 20.9mills/KWH if \$63, 142, 771 in credits from a fuel settlement were included
- (g) Includes no 1984costs
- (f) Includes no 1985costs
- (h) Includes no 1986costs

**美國原電 運轉性能 3 年間 平均 (1984~1986年)**

Averages, 1984-85-86					Averages, 1984-85-86				
Plant	Vendor	Operating Mills/KWH	% Net Capacity	SALP Scores	Plant	Vendor	Operating Mills/KWH	% Net Capacity	SALP Scores
Callaway	W	9.966a,e	83.41a	1.62	Millstone-1	GE	19.760	79.35	1.31
North Anna	W	11.072	70.39	1.76	Indian Point-3	W	20.151	65.03	1.29
Prairie Island	W	11.539	87.27	1.38	Catawba	W	20.494a	58.19a	1.82
Zion	W	11.869	61.32	1.67	WNP-2	GE	21.162a	52.27a	1.96
Nine Mile Point-1	GE	11.990	73.00	1.52	Beaver Valley-1	W	23.060	72.55	1.50
Maine Yankee	CE	12.057	78.54	1.67	Brunswick	GE	24.041	49.60	1.76
Calvert Cliffs	CE	12.308	79.07	1.36	Vermont Yankee	GE	24.856	63.29	1.42
Point Beach	W	12.834	81.24	1.53	Palo Verde-1, 2	CE	26.204a	47.32b	1.82
Oconee	BW	13.217	77.28	1.57	Duane Arnold	GE	26.858	56.39	1.69
Monticello	GE	13.562f	56.30	1.34	Millstone-2	CE	26.922	53.36	1.26
Trojan	W	13.822	66.68	1.88	Indian Point-2	W	27.332	58.80	1.76
Kewaunee	W	13.879	85.88	1.32	Peach Bottom	GE	27.520	49.70	1.84
St. Lucie	CE	13.930	78.48	1.40	Crystal River-3	BW	27.944	54.18	1.97
Quad Cities	GE	13.958	69.27	1.60	Salem	W	28.698	55.25	1.69
Surry	W	13.978	66.51	1.72	Hatch	GE	29.654	57.38	2.07
Wolf Creek	W	14.265a	80.45a	1.59	Connecticut Yankee	W	30.952	67.71	1.65
Gianna	W	15.089	83.92	1.50	Yankee	W	32.900	81.96	1.30
McGuire	W	15.224	61.70	1.54	River Bend	GE	37.008b	68.13b	1.89
Farley 1	W	15.792	81.79	1.29	San Onofre	W	38.015	50.70	1.64
Millatone-3	W	15.862b	84.24b	1.66	Grand Gulf-1	GE	38.589a	48.01a	1.92
LaSalle	GE	16.141	51.21	2.10	Big Rock Point	GE	39.491	71.99	1.62
Limerick-1	GE	16.599b	74.11b	1.43	Pilgrim	GE	49.789f	33.99	1.96
Arkansas Nuclear One	BW	16.687	66.32	1.82	Three Mile Island-1	BW	53.670f	27.56i	1.33
Fort Calhoun	CE	17.037	72.41	1.52	LaCrosse	AC	55.077	56.49	1.84
Diable Canyon	W	17.103a	66.23a	1.41	Palisades	CE	64.485	36.53	2.12
Dresden	GE	17.160	49.57	1.90	Oyster Creek	GE	66.363f	32.66	1.75
Cook	W	17.506	58.02	2.06	<b>PLANTS WITH TOO LITTLE 1986 GENERATION TO FIGURE A THREE-YEAR AVERAGE :</b>				
Robinson-2	W	17.509	58.54	1.65	Fort St.Vrain	GA	(c)	1.32	2.28
Cooper	GE	18.313g	42.74	1.76	Rancho Seco	BW	39.733h	36.91	2.23
Turkey Point-3, 4	W	18.438	64.75	2.24	Davis-Besse	BW	23.516h	27.34*	2.10
Waterford-3	CE	18.488a	50.35a	1.82	Sequoyah	W	14.335h	40.87	1.94
Fitzpatrick	GE	18.492	71.30	1.77	Browns Ferry	GE	22.110h	21.07	2.67
Susquehanna	GE	18.904	65.72	1.22	<b>AVERAGE</b>		<b>23.30</b>	<b>61.08</b>	<b>1.70</b>
Byron-1	W	19.672a	86.15a	2.06					
Summer	W	19.690	71.11	1.56					

**Footnotes :**

- (a) Not in commercial service in 1984
- (b) Not in commercial service in 1984 and 1985
- (c) Too little generation to derive a meaningful number
- (d) Previous year figures not available
- (e) Callaway 1986 costs would total 20.9mills/KWH if \$63, 142, 771 in credits from a fuel settlement were included. The 1985 costs of 7.854mills/KWH also were reduced by the fuel settlement, but the exact amount was not identified in the 1985 FERC Form 1 filing.
- (f) Includes no 1984 costs. For Monticello, Pilgrim, and Oyster Creek, the year is not counted because of extraordinary costs associated with recirculation piping replacements, which also allowed little generation.
- (g) Includes no 1985 costs
- (h) Includes no 1986 costs
- (i) Three Mile Island-1 generated no power until October 1985 under NRC order.