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10 DOWNING STREET

THE PRIME MINISTER

14 March 1984

Dear Solly,

Thank you for your letter of 9 February about civil nuclear power in the USA.

As described in the article from the 'International Herald Tribune' which you enclosed, the American nuclear industry has recently been experiencing considerable difficulties, including a string of cancellations of plants under construction. We must remember, however, that there are a large number of stations operating successfully. These of course receive little publicity!

There are a number of differences between the US and UK electricity generation schemes which make it unlikely, I believe, that the worst features of the American experience will be repeated here. The US is characterised for example, by a large number of small utilities, which vary widely in their experience of managing nuclear projects. Further the American financial system does not allow interest charges on plants under construction to be recouped from current consumers of electricity from existing plants. This hits small utilities particularly hard. In addition the regulatory system is cumbersome and legalistic by comparison with the approach of our Nuclear

/ Installations

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Installations Inspectorate. And the availability of cheap coal in a number of regions of the USA gives nuclear power less attractive economics.

Nevertheless I think we in Government need to keep closely in touch with developments and I know that Peter Walker has this in mind.

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I attach a table supplied by the CEGB giving equivalent data for British stations. These figures do not show similar trends to the American figures, probably because gas cooled reactors do not exhibit the same corrosion features as light water reactors (although the Magnox reactors have, of course, had other corrosion problems).

In the context of the CEGB's proposal to build a PWR at Sizewell B, the Nuclear Installations Inspectorate are carefully monitoring the CEGB's design changes intended to reduce the radiation exposure to workers. The matter is also being taken up during the examination of the safety case at the Inquiry.

/I hope that

I hope that these comments and the figures go some way to explain both the reasons for the US trend and its absence in the UK. Thank you very much for drawing the matter to my attention.

We spoke about this generally at Harold Macmillan's birthday lunch.

Y.
Lansdown

Raymond

The Lord Zuckerman, OM, KCB.



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NO
file?
C.F.
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10 DOWNING STREET

From the Private Secretary

23 March, 1984.

The Prime Minister has asked me to thank you very much for your further letter of 21 March about the safety of nuclear installations.

The Prime Minister certainly does not underestimate the potential seriousness of these issues, and she agrees that it would be a good idea for you to discuss them further with Mr. Agnew at a convenient moment. No doubt you will keep the Secretary of State for Energy, as well as the Prime Minister, in touch.

David Barclay

— The Lord Zuckerman, OM, KCB, FRS.

ve



Prime Minister (2)

To see

ms
2/3

CABINET OFFICE

70 Whitehall, London SW1A 2AS Telephone 01-233 7240/7772

Z/0941

21st March 1984

Dear Prime Minister,

Thank you for your very full reply to my letter of 9th February dealing with the overall safety of American nuclear power installations. I am aware, of course, that the pattern of responsibility for design and engineering of nuclear power stations in the UK is different from that in the US, and that we hold that our standard of engineering is probably higher on average than in the US.

It is also fair to note that -

- (a) the total nuclear power generated in the US is an order of magnitude greater than in the UK;
- (b) the average dose per man in the UK is also lower than that in the US;
- and (c) the upward trend in the UK in the late 70's now seems to have been reversed.

But, without understanding the underlying causes, I still have a feeling - call it a hunch - that we should take very seriously the fact that the general trend in the US over the five years 78-82 inc. is upward. I know that you can rely on the Department of Energy keeping a watchful eye on the situation here, and I would never have drawn your attention or that of Peter Walker to the matter if the source of

/my

The Rt. Hon. Margaret Thatcher, MP
The Prime Minister

my information had not been Harold Agnew. If he is concerned about the long term trends then at least the US has something to worry about. And if anything were to go wrong with the West European nuclear power programme and budget, we would all have something to worry about. At John Peyton's party I suggested to you that at some convenient moment I might go over to see him and sniff around, and you seemed to think this was a good idea. I'll have a word with Robert Armstrong - to whom I'll copy this letter - to see what he thinks.

*Yours ever,
Soly*

S. ZUCKERMAN

27 MAR 1984

10 11 12 1
9 8 7 6 5 4
3 2



Foreign and Commonwealth Office

London SW1A 2AH

12 March 1984

Dear David,

GR
Draft with PM
for sig - DMB
13/3

Thank you for letting us see the draft reply from the Prime Minister to Lord Zuckerman put forward by the Department of Energy. We have no objection to this draft.

I am copying this letter to John Neilson (Department of Energy).

Yours ever,
Peter Ricketts

(P F Ricketts)
Private Secretary

D Barclay Esq,
Private Secretary to the
Prime Minister,
10 Downing Street



10 DOWNING STREET

From the Private Secretary

6 March 1984

I enclose a copy of a letter to the Prime Minister from Lord Zuckerman about the civil nuclear industry in the United States.

The Department of Energy have kindly provided a draft reply for the Prime Minister's signature, a copy of which I also enclose. I should be grateful for any comments you may care to offer, by next Thursday 15 March, if possible please.

I am sending a copy of this letter to John Neilson (Department of Energy).

(David Barclay)

Roger Bone, Esq.,
Foreign and Commonwealth Office.



SECRETARY OF STATE FOR ENERGY
THAMES HOUSE SOUTH
MILLBANK LONDON SW1P 4QJ

01 211 6402

David Barclay Esq
Private Secretary to the
Prime Minister
10 Downing Street
LONDON
SW1

GR
Poe type for
PM's sig.

6 March 1984

6/3

Dear David

Thank you for your letter of 28 February asking for a revised draft reply for the Prime Minister to send to Lord Zuckerman's letter of 9 February.

A redraft is attached which draws more fully on the points made in my Secretary of State's minute of 24 February about differences between the US and UK nuclear scenes.

I hope that this is helpful.

Yours ever

John

J S NEILSON
Private Secretary

CONQUEROR

DRAFT

Thank you for your letter of 9 February about civil nuclear power in the USA.

As described in the article from the 'International Herald Tribune' which you enclosed, the American nuclear industry has recently been experiencing considerable difficulties, including a string of cancellations of plants under construction. We must remember, however, that there are a large number of stations operating successfully. These of course receive little publicity!

There are a number of differences between the US and UK electricity generation scenes which make it unlikely, I believe, that the worst features of the American experience will be repeated here. The US is characterised for example, by a large number of small utilities, some of which are inexperienced and less than competent in the management of nuclear projects. Further the American financial system does not allow interest charges on plants under construction to be recouped from current consumers of electricity from existing plants. This hits small utilities particularly hard. In addition the regulatory system is cumbersome and legalistic by comparison with the approach of our Nuclear Installations Inspectorate. And the availability of cheap coal in a number of regions of the USA gives nuclear power less attractive economics.

Nevertheless I think we in Government need to keep closely in touch with developments and I know that Peter Walker has this in mind.

You enclosed figures on radiation exposure at US commercial power reactors supplied by the American scientist Harold Agnew. These do indeed show an increase in the collective dose without much increase in generating capacity.

I am advised that there may be two main reasons for this. The first is post Three Mile Island backfitting operations at all stations.

The second is steam generator replacement and repair on PWRs, and repair work on feedwater and other stainless steel pipe works on Boiling Water Reactors. Although steam generator replacement work and repair work is continuing, experience is leading to better procedures and it is to be hoped that the overall statistics will improve.

I attach a table supplied by the CEGB giving equivalent data for British stations. These figures do not show similar trends to the American figures, probably because gas cooled reactors do not exhibit the same corrosion features as light water reactors (although the Magnox reactors have, of course, had other corrosion problems).

In the context of the CEGB's proposal to build a PWR at Sizewell B, the Nuclear Installations Inspectorate are carefully monitoring the CEGB's design changes intended to reduce the radiation exposure to workers. The matter is also being taken up during the examination of the safety case at the Inquiry.

hope that
I ~~trust~~ these comments and *the* figures *go some way to* explain both the reasons for the US trend and its absence in the UK. Thank you *very much* for drawing *the matter to* my attention ~~to the US figures.~~

CEGB + non-CEGB
Classified

	Electricity supplied (MW-yrs)	Average DNC (MW so)	No. of Stations	Collective dose	No. of Persons
74	2680.1	3446	8	1531	5139
75	2392.4	3459	8	1265	5114
76	2850.6	3568	9	1281	5398
77	2857.9	3862	9	1550	6622
78	3025.7	3932	9	1635	6856
79	2949.4	4230	9	1674	6732
80	2641.6	4385	9	1667	7629
81	2715.6	4467	9	1460	7939
82	3113.3	4476	9	1215	8208

	Man rem per MWyr	Man rem per MW so	Average collective dose per station	Average dose per person
74	0.571	0.444	191.4	0.30
75	0.529	0.366	158.1	0.24
76	0.449	0.359	142.3	0.23
77	0.542	0.401	172.2	0.23
78	0.540	0.416	181.7	0.23
79	0.568	0.396	186.0	0.24
80	0.631	0.380	185.2	0.22
81	0.538	0.327	162.2	0.18
82	0.390	0.271	135.0	0.15

1. All data refers to calendar years, therefore generation data may not tally with Annual Report figures which refer to financial years.
2. Refers only to CEGB Nuclear Power Stations

- 6 MAR 1984





Feb 28

LORD ZUCKERMAN

10 DOWNING STREET

From the Private Secretary

28 February 1984

The Prime Minister was grateful for your Secretary of State's minute of 24 February, with which was enclosed a draft reply to Lord Zuckerman's letter of 9 February.

The Prime Minister has questioned the argument in the third and fourth paragraphs of the draft that differences in safety procedures are sufficiently important to mean that US experience is unlikely to be repeated here. She feels that there are other more obvious differences between US and UK situations which justify the same conclusion.

I should be grateful if you could look again at this section of the draft reply, and let me have a revision as soon as possible.

DAVID BARCLAY

John Neilson, Esq.,
Department of Energy.

DB



10 DOWNING STREET

THE PRIME MINISTER

Dear Solly,

Thank you for your letter of 9 February about civil nuclear power in the USA.

The American nuclear industry has certainly been experiencing considerable difficulties, although we must remember that there are a large number of stations operating successfully. These, of course, do not receive publicity!

The worst features of the US experience are, I believe, unlikely to be repeated here. Many of their problems arise, for example, from their highly legalistic safety regulation procedures which can lead to substantial building delays and associated requirements for considerable retrofitting to stations under construction.

I don't think this is the most obvious difference

Nevertheless I think we in Government need to keep closely in touch with developments and I know that Peter Walker has this in hand.

You enclosed figures on radiation exposure at US commercial power reactors supplied by the American scientist, Harold Agnew. These do indeed show an increase in the collective dose without much increase in generating capacity.

/ I am advised

I am advised that there may be two main reasons for this. The first is post Three Mile Island backfitting operations at all stations. The second is steam generator replacement and repair on PWRs, and repair work on feedwater and other stainless steel pipe works on Boiling Water Reactors. Although steam generator replacement work and repair work is continuing, experience is leading to better procedures and it is to be hoped that the overall statistics will improve.

I attach a table supplied by the CEGB giving equivalent data for British stations. These figures do not show similar trends to the American figures, probably because gas cooled reactors do not exhibit the same corrosion features as light water reactors (although the Magnox reactors have, of course, had other corrosion problems).

In the context of the CEGB's proposal to build a PWR at Sizewell B, the Nuclear Installations Inspectorate are carefully monitoring the CEGB's design changes intended to reduce the radiation exposure to workers. The matter is also being taken up during the examination of the safety case at the Inquiry.

I hope that these comments and the figures go some way to explain both the reasons for the US trend and its absence in the UK. Thank you very much for drawing the matter to my attention.

Lord Zuckerman, OM, KCB.



Prime Minister (3)

Draft reply to Lord Zuckerman attached, for signature if you agree.

DMS
27/2

PRIME MINISTER

Your Private Secretary, in his letter of 10 February to mine, has asked for advice on a letter from Solly Zuckerman about the problems of civil nuclear power in the USA.

I have been keeping a careful eye on the American scene. In general the information I have received is in line with that contained in the International Herald Tribune article attached to Solly Zuckerman's letter. There have been numerous examples of delay and cost overruns in the construction of nuclear stations of which the recent plant cancellations are only the latest example. There are no new orders for nuclear power stations and none are expected in the near future.

Nuclear power in the USA is, however, by no means dead - there are about 70 plants currently in operation, none of which are known to have any outstanding technical problems.

Further I consider that there are a number of differences between the US and UK electricity generation scenes which make it highly unlikely that the American experience will be repeated here. The US is characterised by

- (a) a large number of small utilities, some of which are inexperienced and less than competent in the management of nuclear projects;
- (b) a financial system which does not allow interest charges on plants under construction to be recouped from current consumers of electricity from existing plants. This hits small utilities particularly hard;
- (c) highly legalistic safety regulation procedures which can lead to substantial building delays and associated requirements for retrofitting to stations under construction;

recouped? ?



(d) the availability of cheap coal in a number of regions which gives nuclear power less attractive economics.

Nevertheless there is a danger that the image of the UK industry may be tarnished in the public mind by the publicity given to recent events in the USA. I intend to take every opportunity to rebut such an association.

Solly Zuckerman also draws attention in his letter to figures on radiation exposure at US commercial power reactors, supplied by the American scientist Harold Agnew.

These figures do show an undoubted increase in collective dose without much increase in generating capacity. This appears to arise from post Three Mile Island backfitting operations at all stations and repair and replacement work at Pressurised Water Reactors and Boiling Water Reactors. Experience is leading to better procedures and it is hoped that the overall statistics should show an improvement in future.

Fortunately radiation exposure figures from the CEGB show that we are not experiencing a similar trend in England and Wales. It is likely that gas cooled reactors do not exhibit the same features as light water reactors where there can be corrosion in the circuits. (Of course Magnox reactors have suffered from different corrosion problems).

Our main concern must be the safety of workers at any future PWR built in this country. The Nuclear Installations Inspectorate are well aware of the problem and are monitoring closely the CEGB proposals for design improvements to reduce workers' radiation exposure at Sizewell B. The matter is also under consideration at the Inquiry.

I attach a draft reply for you to send to Solly Zuckerman. This has been prepared in consultation with the Nuclear Installations Inspectorate.

	Electricity supplied (MW-yrs)	Average DNC (MW so)	No. of Stations	CEGB + non-CEGB Classified	
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2. Refers only to CEGB Nuclear Power Stations

24 JAN 1984





DRAFT REPLY FOR PRIME MINISTER TO SEND TO:

Lord Zuckerman
Cabinet Office
LONDON SW1

Thank you for your letter of 9 February about civil nuclear power in the USA.

The American nuclear industry has certainly been experiencing considerable difficulties, although we must remember that there are a large number of stations operating successfully. These of course do not receive publicity!

The worst features of the US experience are, I believe, unlikely to be repeated here. Many of their problems arise, for example, from their highly legalistic safety regulation procedures which can lead to substantial building delays and associated requirements for considerable retrofitting to stations under construction.

Nevertheless I think we in Government need to keep closely in touch with developments and I know that Peter Walker has this in hand.

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hope that these I ~~trust these~~ comments and *the* figures *go some way to* satisfactorily *very much* explain both the reasons for the US trend and its absence in the UK. Thank you *for* drawing *the matter to* my attention ~~to the US figures~~



File

BRIEFING FOR PM'S QUESTIONS

SIZEWELL 'B': ORDERING OF MATERIALS BY CEGB BEFORE CONSENT

Line to Take

The CEGB have decided to incur expenditure of £12 million at their own risk on forgings for the proposed Sizewell PWR. The CEGB's own commercial judgement is that the cost of delay outweighed the financial risk of consent not being given. The Board's decision in no way affects the outcome of the Inquiry, or the Government's views on the Board's application.

Background Note

The CEGB are making a statement at the Sizewell Inquiry on Tuesday, 7 February (copy attached) that they have decided to place orders for some £12 million worth of long lead materials for the proposed Sizewell B power station.

These materials, costing £12 million, are forgings (special steel sections) for the pressure vessel and for other main components of the reactor. If these materials are not ordered now, the construction of Sizewell B will be delayed by up to 16 months. The cost of the delay is estimated at up to £90 million in increased interest charges, disruption to engineering programmes and loss of benefit from lower generating costs.

The Secretary of State for Energy was consulted by CEGB on this decision. He accepted it on the basis that it was the Board's commercial judgement that the cost of delay outweighed the financial risk of consent not being given. The Secretary of State's view was endorsed by the PM and by the Chancellor.

An application for a Private Notice Question on this subject from the Hon Member for Berwick-upon-Tweed (Alan Beith) was disallowed on Monday 6 February.

Lord ZUCKERMAN



DOE
24/2

10 DOWNING STREET

From the Private Secretary

10 February 1984

I enclose a copy of a letter to the Prime Minister from Lord Zuckerman about the US civil nuclear industry. I should be grateful if you could prepare, in consultation with the Department of the Environment, a draft reply for the Prime Minister's signature.

I am copying this letter to Alan Davis (DOE) and to Richard Hatfield (Cabinet Office). Could I please have the draft reply by Friday 24 February?

David Barclay

J.S. Neilson, Esq.,
Department of Energy.

✓



CABINET OFFICE
LONDON, S.W. 1

~~WHICH~~ ~~XXXX~~
Z0940

9th February, 1984

The Rt Hon. Margaret Thatcher, MP
10 Downing Street,
London SW1

Prime Minister (2)

To see. We will give
you a draft reply.

Dear Prime Minister,

I am sure that you are aware of the difficulties now facing, or even threatening, the US civil nuclear industry. The attached cutting from the International Herald Tribune tells the story, which has also been spelt out recently in the columns of Nature and the New Scientist. The reason why I am writing is that some weeks ago an old friend of mine, Harold Agnew by name, who until two years ago was Director of Los Alamos and who is now head of a company called G.A. Technologies, sent me out of the blue some figures which he had also submitted to Sir Frank Hayfield of the Nuclear Installation Inspectorate. These figures, copies of which I attach, indicate an increase in the levels of radiation exposure over the years from 1978 to 1982. It is obvious that they have gone up significantly without any real increase in gross electric generation. As I understand it, the figures for Man-Rems are nowhere near danger levels, and I would not have bothered at all about the matter had it not been for the fact that Harold Agnew, whom I have known for well over twenty years, is a committed nuclear man.

In his covering letter to me he said, "I don't believe your officials fully appreciate the down stream problem they are going to encounter. We're just beginning to realise it here. Maybe too late."

I have passed the tables both to the Department of Energy and to DoE. But I should feel easier in my mind if I knew you had them -- just in case there is something in the concern expressed to me by Agnew.

John ...
Sally

c: Sir Robert Armstrong

Asked 18/2

Dms
9/2

11/13/11/84

New Problems Threaten U.S. Nuclear Industry

Tougher Government Licensing, Stagnant Power Demand Cited

By Milton Benjamin

Washington Post Service

WASHINGTON — The U.S. nuclear power industry is in trouble again, reeling under a barrage of blows to its perceived ability to build and operate the reactors that generate 12 percent of the country's electricity.

In the last two weeks, a nearly completed \$3.3-billion plant in Illinois, Byron, was denied an operating license on safety grounds, the first time this has happened. A second nearly completed \$1.7-billion plant in Ohio was deemed so flawed that its owners proposed converting it to a coal plant.

Two other plants in Indiana, Marble Hill, in which \$2.5 billion had been invested, were abandoned in despair by a nearly bankrupt utility. A temporarily shut-down \$1-billion nuclear plant in Alabama, Browns Ferry, laid off 400 workers because of "numerous violations" of government rules.

Beyond the cost to the utilities, their shareholders and eventually, in many cases, to their customers, the shakedown in the industry almost certainly will mean that many of the 48 nuclear power plants still under construction will not be completed.

With little increase in demand for power in the United States the past few years, partly because of the recession, utilities have no trouble meeting their customers' needs. But some experts say the combination of the cancellations and a resurgence in demand for electricity could make power shortages once again a feature of life for many Americans in the 1990s.

The nuclear industry's woes are good news for the Organization of Petroleum Exporting Countries. Many of the abandoned units would have replaced aging oil-fired plants that use almost half the amount of crude oil the United States imports daily.

Only a month ago, the U.S. nuclear industry optimistically was looking to its best year since the 1979 accident at Three Mile Island in Pennsylvania, the worst in civilian atomic power history.

Industry officials talked hopefully of 14 new power plants receiving licenses in 1984, equaling the single-year record, joining the 79 already in operation.

The shadow on the industry, government and industry sources agree, has been cast by a number of "problem plants," whose owners have found it difficult to adjust to the tougher licensing climate that has emerged since the Three Mile Island accident.

out Mr. Reagan's promise to help make it easier to build atomic power plants, found himself in the unexpected position in November 1981 of warning utilities that quality control at construction sites appeared to be a major problem.

"At that time, there were about a half-dozen plants that seemed to be steeped in these problems," Mr. Palladino said.

Mr. Palladino said it was "unfortunate" that plants like Zimmer, the \$1.7-billion facility located outside Cincinnati that faces possible conversion into a coal-fired unit at a cost of additional hundreds of millions of dollars, got to a point where their builders felt they could not meet NRC requirements.

"Nevertheless, we felt that our requirements had to be met so these plants could be judged to be safe and the public health and safety would be protected," Mr. Palladino said.

As the problems at these plants festered and construction timetables began to be reckoned in terms of decades, the cost of the projects increased as much as tenfold, fueled by double-digit inflation and 20-percent prime interest rates.

The threat these multibillion-dollar overruns could pose to utilities, whose securities were once viewed by Wall Street as the safest of risks, was brought home with a crash when Washington Public Power Supply System partially defaulted on bonds issued for a program to build five reactors.

"It is increasingly evident that the industry itself is largely to blame for its dismal history and dark future," said Representative Edward J. Markey, a Massachusetts Democrat who is a leading critic of the nuclear industry. "I say, let nuclear power meet its maker in the marketplace."

But despite its current woes, industry officials insist nuclear power has a future and that, despite all the cost overruns, the atom still has an economic advantage over its archrival, coal, in most parts of the country.

"I think nuclear needs to be a part of our country's energy mix," Energy Secretary Donald P. Hodel said.

But not a single new atomic power plant has been ordered since 1978, and Mr. Gilinsky said he thinks the future of nuclear power will depend on whether the lull is used to straighten out the problems of the past.

"We're still cleaning up the problems of the past and we'd better get them sorted out before we think of going any further," Mr. Gilinsky said.

"To some extent, it's a matter of coincidence that all of these are hitting the headlines at once," said Victor Gilinsky, a member of the Nuclear Regulatory Commission. "But there are a lot of troubled projects, and a number of them presumably still will go under."

While more than 57 atomic power plants ordered before the Three Mile Island accident subsequently were canceled, a number of utilities, including many with little nuclear experience, continued forging ahead building reactors despite the blizzard of new regulations.

"I think our major problems are with the smaller utilities who didn't have an appreciation for what they are getting into and didn't develop within their organizations a spirit of getting the thing built properly," said the NRC chairman, Nunzio J. Palladino.

One reason for this, said Mr. Gilinsky, who was appointed to the commission in 1975 by President Gerald R. Ford and is the only remaining commissioner to predate the Reagan administration, was that "enforcement of rules during construction was very lax" before the Three Mile Island accident.

"Utilities were getting away with quite a lot and others thought they could get away with more," Mr. Gilinsky said. "Now, ironically with four Reagan appointees on the commission, the chickens have come home to roost."

Mr. Palladino, who was looked to by the nuclear industry to carry