ENCLOSURE 2

RA-ENO-EP1-10-135

Response to NRC Supplemental RAIs 1, 4, 5, and 6 for James A FitzPatrick
Cycle 20 SLMCPR Submittal

Non-Proprietary Information

INFORMATION NOTICE

NRC RAI-01

    a. For the "Cycle 20 Core" table provided in response to RAI-01 in the July 15, 2010, supplement, please provide a core map identifying each fuel assemblies including Cycle 18 (thrice-burn) through Cycle 20 (fresh fuel) and identifying assemblies reached 0.1 % boiling transition criterion for the SLMCPR value calculation.

    b. Provide more details to describe how each of the identified inputs was used to determine the final core loading pattern for Cycle 20. Also provide a flow chart to show specific values/limit and to describe the inter-relationship among the inputs of: cycle energy requirements, reactivity margins, discharge exposure limitations and other limits, desired control rod patterns, and minimize channel distortion.

    c. Core design is an iterative process designed to develop an optimal configuration that meets both operational requirements such as those identified in the response to RAI-01 and all applicable safety limits. Please provide a description of the core design process used for Cycle 20 and the Quality Assurance and Quality Control procedures in place to assure that the final design meets the SLMCPR limits for the fuel used in the core.

GNF Response

Reference: NRC Audit on Fitzpatrick C20 SLMCPR Tech. Spec. Change letter.
Attendees: Tai Huang (NRC), Tony Attard (NRC), George Rorke (Entergy), Atul Karve (GNF), and Russ Fawcett (GNF).
Time and Place: August 10, 2010, 9.00am to 3.00pm, NEI office at 1776 I Street NW, Suite 400, Washington, DC, 20006

RAI-01 Part a. This question consists of two parts.

At the audit it was agreed that to close the first part of Part a, FitzPatrick C19 and C20 bundle ID maps and bundle type maps are adequate.

    1. Fitzpatrick C19 reference loading pattern bundle ID and bundle type map is shown in the enclosed three figures labeled Fitzpatrick Cycle 19 Bundle ID (2 figures) and Type Map.

    2. Fitzpatrick C20 reference loading pattern bundle ID and bundle type map is shown in the enclosed three figures labeled Fitzpatrick Cycle 20 Bundle ID (2 figures) and Type Map.

The response to RAI-06 (1) addresses the second part of RAI-01 Part a.

RAI-01 Part b. At the audit it was agreed that to close RAI-01 Part b, the presentation provided by Russ Fawcett, on the basics of how GNF performs fuel cycle core design is adequate. The presentation is provided in Enclosure 3 labeled as Attachment 1. Please note that the presentation is general information, which is subject to change, and is not intended to reflect specific procedures.

Fitzpatrick C19 Bundle ID Map

	1	2	3	4	5	6	7	8	9	10	11	12	13
1									JLM361	JLM401	JLM309	JLM269	JLM369
2								JLM325	JLM345	JLM301	JLM405	JLM321	JLM341
3					JLM285	JLM441	JLM305	JLM277	JLY765	JLM365	JLY748	JLM389	JLM417
4				JLM381	JLM449	JLY852	JLY869	JLY689	JYE453	JYE461	JYE469	JYE477	JYE485
5			JLM393	JLM445	JLM293	JLY816	JLY757	JYE517	JLY809	JYE429	JLY857	JYE437	JLY769
6			JLM329	JLY873	JLY720	JLY697	JYE493	JYE501	JYE509	JLY733	JYE445	JLY721	JYE525
7			JLM273	JLY865	JLY693	JYE497	JLY813	JLY881	JYE533	JLY773	JYE541	JLY821	
8		JLM433	JLM413	JLY777	JYE521	JYE505	JYE609	JLY861	JYE549	JLY825	JYE557	JLY761	JYE613
9	JLM265	JLM289	JLY741	JYE457	JLY701	JYE513	JLY729	JYE553	JLY717	JYE565	JLY878	JYE573	JLY817
10	JLM864	JLM453	JLM297	JYE465	JYE433	JLY829	JYE537	JLY801	JYE569	JLY785	JYE581	JLY725	JYE589
11	JLM861	JLM421	JLY685	JYE473	JLY837	JYE449	JLY781	JYE561	JLY841	JYE585	JLY709	JYE621	JLY756
12	JLM409	JLM385	JLM429	JYE481	JYE441	JLY853	JYE545	JLY833	JYE577	JLY845	JYE625	JLY713	JLY597
13	JLM437	JLM425	JLM461	JYE489	JLY745	JYE529	JLY749	JYE617	JLY789	JYE593	JLY805	JYE601	JLY753
14	JLM440	JLM428	JLM464	JYE492	JLY705	JYE532	JLY824	JYE620	JLY792	JYE596	JLY808	JYE604	JLY737
15	JLM412	JLM388	JLM432	JYE484	JYE444	JLY851	JYE548	JLY836	JYE580	JLY712	JYE628	JLY850	JYE600
16	JLM384	JLM424	JLY688	JYE476	JLY840	JYE452	JLY820	JYE564	JLY844	JYE588	JLY716	JYE624	JLY819
17	JLM458	JLM456	JLM300	JYE468	JLY832	JYE436	JLY540	JLY804	JYE572	JLY788	JYE584	JLY728	JYE592
18	JLM268	JLM292	JLY744	JYE460	JLY704	JYE516	JLY732	JYE556	JLY800	JYE568	JLY877	JYE576	JLY724
19		JLM436	JLM416	JLY708	JYE524	JYE508	JYE612	JLY864	JYE552	JLY828	JYE560	JLY764	JYE616
20			JLM276	JLY868	JLY696	JYE500	JLY818	JYE608	JLY884	JYE536	JLY776	JYE544	JLY797
21			JLM332	JLY876	JLY796	JLY700	JYE496	JYE504	JYE512	JLY795	JYE448	JLY739	JYE528
22			JLM396	JLM448	JLM296	JLY760	JLY872	JYE520	JLY706	JYE432	JLY849	JYE440	JLY772
23				JLM457	JLM452	JLY848	JLY872	JLY692	JYE456	JYE464	JYE472	JYE480	JYE488
24					JLM288	JLM444	JLM308	JLM280	JLY766	JLM368	JLY768	JLM392	JLM420
25								JLM328	JLM348	JLM304	JLM408	JLM324	JLM344
26									JLM364	JLM404	JLM312	JLM272	JLM372

Fitzpatrick C19 Bundle ID Map

	14	15	16	17	18	19	20	21	22	23	24	25	26
1	JLM370	JLM270	JLM310	JLM402	JLM362								
2	JLM342	JLM322	JLM302	JLM346	JLM326								
3	JLM418	JLM390	JLY780	JLM366	JLY736	JLM278	JLM306	JLM442	JLM286				
4	JYE486	JYE478	JYE470	JYE462	JYE454	JLY690	JLY870	JLY860	JLM450	JLM382			
5	JLY770	JYE438	JLY858	JYE430	JLY810	JYE518	JLY758	JLY794	JLM294	JLM446	JLM394		
6	JYE526	JLY738	JYE446	JLY734	JYE510	JYE502	JYE494	JLY698	JLY812	JLY874	JLM330		
7	JLY750	JYE542	JLY774	JYE534	JYE606	JLY814	JYE498	JLY694	JLY866		JLM274		
8	JYE614	JLY762	JYE558	JLY826	JYE550	JLY862	JYE610	JYE506	JYE522	JLY778	JLM414	JLM434	
9	JLY722	JYE574	JLY880	JYE566	JLY718	JYE554	JLY730	JYE514	JLY702	JYE458	JLY742	JLM290	JLM266
10	JYE590	JLY726	JYE582	JLY786	JYE570	JLY802	JYE538	JLY830	JYE434	JYE466	JLM298	JLM454	JLM460
11	JLY798	JYE622	JLY714	JYE586	JLY842	JYE562	JLY782	JYE450	JLY838	JYE474	JLY686	JLM422	JLM862
12	JYE598	JLY846	JYE626	JLY710	JYE578	JLY834	JYE546	JLY854	JYE442	JYE482	JLM430	JLM386	JLM410
13	JLY754	JYE602	JLY806	JYE594	JLY790	JYE618	JLY822	JYE530	JLY746	JYE490	JLM462	JLM426	JLM438
14	JLY755	JYE603	JLY807	JYE595	JLY791	JYE619	JLY751	JYE531	JLY747	JYE491	JLM463	JLM427	JLM439
15	JYE599	JLY847	JYE627	JLY711	JYE579	JLY835	JYE547	JLY855	JYE443	JYE483	JLM431	JLM387	JLM411
16	JLY799	JYE623	JLY715	JYE587	JLY843	JYE563	JLY783	JYE451	JLY839	JYE475	JLY687	JLM423	JLM863
17	JYE591	JLY727	JYE583	JLY787	JYE571	JLY803	JYE539	JLY831	JYE435	JYE467	JLM299	JLM455	JLM459
18	JLY723	JYE575	JLY879	JYE567	JLY719	JYE555	JLY731	JYE515	JLY703	JYE459	JLY743	JLM291	JLM267
19	JYE615	JLY763	JYE559	JLY827	JYE551	JLY863	JYE611	JYE507	JYE523	JLY779	JLM415	JLM435	
20	JLY823	JYE543	JLY775	JYE535	JLY883	JYE607	JLY815	JYE499	JLY695	JLY867	JLM275		
21	JYE527	JLY740	JYE447	JLY735	JYE511	JYE503	JYE495	JLY699	JLY752	JLY875	JLM331		
22	JLY771	JYE439	JLY859	JYE431	JLY811	JYE519	JLY759	JLY793	JLM295	JLM447	JLM395		
23	JYE487	JYE479	JYE471	JYE463	JYE455	JLY691	JLY871	JLY856	JLM451	JLM383			
24	JLM419	JLM391	JLY784	JLM367	JLY767	JLM279	JLM307	JLM443	JLM287				
25	JLM343	JLM323	JLM407	JLM303	JLM347	JLM327							
26	JLM371	JLM271	JLM311	JLM403	JLM363								

Fitzpatrick C19 Bundle Type Map

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	0	0	0	0	0	0	0	0	1	1	1	2	1	1	2	1	1	1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
3	0	0	0	0	2	1	1	2	3	1	3	1	1	1	1	3	1	3	2	1	1	2	0	0	0	0
4	0	0	0	1	1	4	4	3	9	9	9	9	9	9	9	9	9	9	3	4	4	1	1	0	0	0
5	0	0	1	1	1	3	3	7	3	10	4	10	5	5	10	4	10	3	7	3	3	1	1	1	0	0
6	0	0	1	4	3	3	8	8	8	3	10	3	7	7	3	10	3	8	8	8	3	3	4	1	0	0
7	0	0	2	4	3	8	3	6	4	7	3	7	3	3	7	3	7	4	6	3	8	3	4	2	0	0
8	0	1	1	3	7	8	6	4	7	3	7	3	6	6	3	7	3	7	4	6	8	7	3	1	1	0
9	2	1	3	9	3	8	5	7	3	7	4	7	3	3	7	4	7	3	7	5	8	3	9	3	1	2
10	1	1	1	9	10	5	7	3	7	5	7	3	7	7	3	7	5	7	3	7	5	10	9	1	1	1
11	1	1	3	9	4	10	3	7	4	7	3	6	3	3	6	3	7	4	7	3	10	4	9	3	1	1
12	1	1	1	9	10	4	7	3	7	4	6	3	7	7	4	6	3	7	3	7	4	10	9	1	1	1
13	1	1	1	9	3	7	3	6	3	7	3	7	3	3	7	3	7	3	6	3	7	3	9	1	1	1
14	1	1	1	9	3	7	3	6	3	7	3	7	3	3	7	3	7	3	6	3	7	3	9	1	1	1
15	1	1	1	9	10	4	7	3	7	3	6	4	7	7	4	6	3	7	3	7	4	10	9	1	1	1
16	1	1	3	9	4	10	3	7	4	7	3	6	3	3	6	3	7	4	7	3	10	4	9	3	1	1
17	1	1	1	9	10	5	7	3	7	5	7	3	7	7	3	7	5	7	3	7	5	10	9	1	1	1
18	2	1	3	9	3	8	5	7	3	7	4	7	3	3	7	4	7	3	7	5	8	3	9	3	1	2
19	0	1	1	3	7	8	6	4	7	3	7	3	6	6	3	7	3	7	4	6	8	7	3	1	1	0
20	0	0	2	4	3	8	3	6	4	7	3	7	3	3	7	3	7	4	6	3	8	3	4	2	0	0
21	0	0	1	4	3	3	8	8	8	3	10	3	7	7	3	10	3	8	8	8	3	3	4	1	0	0
22	0	0	1	1	1	3	3	7	3	10	4	10	5	5	10	4	10	3	7	3	3	1	1	1	0	0
23	0	0	0	1	1	4	4	3	9	9	9	9	9	9	9	9	9	9	3	4	4	1	1	0	0	0
24	0	0	0	0	2	1	1	2	3	1	3	1	1	1	1	3	1	3	2	1	1	2	0	0	0	0
25	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	1	1	1	2	1	1	2	1	1	1	0	0	0	0	0	0	0	0

Fitzpatrick C20 Bundle ID Map

	1	2	3	4	5	6	7	8	9	10	11	12	13
1									JLY881	JLY813	JLY773	JLY817	JLY825
2								JLY761	JLY878	JLY689	JLY869	JLY720	JLY745
3					JLY785	JLY769	JLY709	JLY693	JYE577	JYE477	JYE581	JYE521	JYE433
4				JLY816	JLY756	JLY713	JYE561	JYE541	JYM421	JYM429	JYM437	JYM445	JYM517
5			JLY701	JLY801	JLY852	JYE605	JYE461	JYM461	JYE457	JYM525	JYE493	JYM533	JYE481
6			JLY733	JLY809	JYE609	JYE469	JYM453	JYM541	JYM549	JYE505	JYM469	JYE509	JYM477
7			JLY805	JYE545	JYE473	JYE441	JYM457	JYM557	JYE569	JYM485	JYE565	JYM493	JYE589
8		JLY833	JLY697	JYE585	JYM465	JYM545	JYM561	JYE465	JYM501	JYE621	JYM509	JYE597	JYM565
9	JLY717	JLY861	JYE529	JYM425	JYE453	JYM553	JYE593	JYM505	JYE437	JYM573	JYE533	JYM581	JYE617
10	JLY837	JLY777	JYE485	JYM433	JYM529	JYE501	JYM489	JYE625	JYM577	JYE445	JYM589	JYE549	JYM597
11	JLY781	JLY865	JYE537	JYM441	JYE497	JYM473	JYE557	JYM513	JYE573	JYM593	JLY765	JYM605	JLY748
12	JLY789	JLY741	JYE517	JYM449	JYM537	JYE513	JYM497	JYE601	JYM585	JYE553	JYM609	JYE429	JYM613
13	JLY729	JLY757	JYE449	JYM521	JYE489	JYM481	JYE525	JYM569	JYE613	JYM601	JLY685	JYM617	JLY873
14	JLY795	JLY760	JYE452	JYM524	JYE492	JYM484	JYE528	JYM572	JYE616	JYM604	JLY688	JYM620	JLY876
15	JLY792	JLY744	JYE520	JYM452	JYM540	JYE516	JYM500	JYE604	JYM588	JYE556	JYM612	JYE432	JYM616
16	JLY820	JLY868	JYE540	JYM444	JYE500	JYM476	JYE560	JYM516	JYE576	JYM596	JLY766	JYM608	JLY768
17	JLY800	JLY708	JYE488	JYM436	JYM532	JYE504	JYM492	JYE628	JYM580	JYE448	JYM592	JYE552	JYM600
18	JLY840	JLY864	JYE532	JYM428	JYE456	JYM556	JYE596	JYM508	JYE440	JYM576	JYE536	JYM584	JYE620
19		JLY836	JLY700	JYE588	JYM468	JYM548	JYE564	JYE468	JYM504	JYE624	JYM512	JYE600	JYM568
20			JLY808	JYE548	JYE476	JYM460	JYE444	JYM560	JYE572	JYM488	JYE568	JYM496	JYE592
21			JLY804	JLY706	JYE612	JYE472	JYM456	JYM544	JYM552	JYE508	JYM472	JYE512	JYM480
22			JLY776	JLY732	JLY784	JYE608	JYE464	JYM464	JYE460	JYM528	JYE496	JYM536	JYE484
23				JLY707	JLY772	JLY788	JYE564	JYE696	JYE580	JYE480	JYE584	JYE524	JYE436
24					JLY724	JLY819	JLY704	JLY764	JLY877	JLY692	JLY872	JLY796	JLY705
25									JLY884	JLY818	JLY850	JLY716	JLY828
26													

Fitzpatrick C20 Bundle ID Map

	14	15	16	17	18	19	20	21	22	23	24	25	26
1	JLY786	JLY714	JLY882	JLY814	JLY826								
2	JLY746	JLY812	JLY870	JLY690	JLY880	JLY762							
3	JYE434	JYE522	JYE582	JYE478	JYE578	JLY694	JLY734	JLY774	JLY722				
4	JYM518	JYM446	JYM438	JYM430	JYM422	JYE542	JYE562	JLY730	JLY770	JLY794			
5	JYE482	JYM534	JYE494	JYM526	JYE458	JYM462	JYE462	JYE606	JLY860	JLY802	JLY846		
6	JYM478	JYE510	JYM470	JYE506	JYM550	JYM542	JYM454	JYE470	JYE610	JLY810	JLY798		
7	JYE590	JYM494	JYE566	JYM486	JYE570	JYM558	JYE442	JYE458	JYE474	JYE546	JLY806		
8	JYM566	JYE598	JYM510	JYE622	JYM502	JYE466	JYM562	JYM546	JYM466	JYE586	JLY698	JLY834	
9	JYE618	JYM582	JYE534	JYM574	JYE438	JYM506	JYE594	JYM554	JYE454	JYM426	JYE530	JLY862	JLY718
10	JYM598	JYE550	JYM590	JYE446	JYM578	JYE626	JYM490	JYE502	JYM530	JYM434	JYE486	JLY778	JLY838
11	JLY780	JYM606	JLY736	JYM594	JYE574	JYM514	JYE558	JYM474	JYE498	JYM442	JYE538	JLY866	JLY782
12	JLY614	JYE430	JYM610	JYE554	JYM586	JYE602	JYM498	JYE514	JYM538	JYM450	JYE518	JLY742	JLY790
13	JLY874	JYM618	JLY686	JYM602	JYE614	JYM570	JYE526	JYM482	JYE490	JYM522	JYE450	JLY758	JLY702
14	JLY848	JYM619	JLY687	JYM603	JYE615	JYM571	JYE527	JYM483	JYE491	JYM523	JYE451	JLY759	JLY719
15	JYM615	JYE431	JYM611	JYE555	JYM587	JYE603	JYM499	JYE515	JYM539	JYM451	JYE519	JLY743	JLY791
16	JLY875	JYM607	JLY767	JYM595	JYE575	JYM515	JYE559	JYM475	JYE499	JYM443	JYE539	JLY867	JLY799
17	JYE599	JYE551	JYM591	JYE447	JYE579	JYE627	JYE503	JYM491	JYE503	JYM435	JYE487	JLY779	JLY839
18	JYE619	JYM583	JYE535	JYM575	JYE439	JYM507	JYE595	JYM555	JYE455	JYM427	JYE531	JLY863	JLY731
19	JYM567	JYE599	JYM511	JYE623	JYM503	JYE467	JYM563	JYM547	JYM467	JYE587	JLY699	JLY835	
20	JYE591	JYM495	JYE567	JYM487	JYE571	JYM559	JYE443	JYM459	JYE475	JYE547	JLY807		
21	JYM479	JYE511	JYM471	JYE507	JYM551	JYM543	JYM455	JYE471	JYE611	JLY811	JLY735		
22	JYE483	JYM535	JYE495	JYM527	JYE459	JYM463	JYE463	JYE607	JLY856	JLY803	JLY703		
23	JYM519	JYM447	JYM439	JYM431	JYM423	JYE543	JYE563	JLY715	JLY771	JLY793			
24	JYE435	JYE523	JYE583	JYE479	JYE579	JLY695	JLY783	JLY847	JLY723				
25	JLY747	JLY752	JLY871	JLY691	JLY879	JLY763							
26	JLY787	JLY883	JLY775	JLY815	JLY827								

Fitzpatrick C20 Bundle Type Map

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	0	0	0	0	0	0	0	0	4	3	3	3	3	3	3	4	3	3	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	3	4	3	4	3	3	3	3	4	3	4	3	0	0	0	0	0	0	0
3	0	0	0	0	3	3	3	3	7	9	7	7	10	10	7	7	9	7	3	3	3	3	0	0	0	0
4	0	0	0	3	3	3	7	7	14	14	14	14	16	16	14	14	14	14	7	7	3	3	3	0	0	0
5	0	0	3	3	4	6	9	13	9	16	8	16	9	9	16	8	16	9	13	9	6	4	3	4	0	0
6	0	0	3	3	6	9	14	16	16	8	13	8	13	13	8	13	8	16	16	14	9	6	3	3	0	0
7	0	0	3	7	9	14	10	16	7	12	7	12	7	7	12	7	12	7	16	10	14	9	7	3	0	0
8	0	3	3	7	13	16	16	9	12	6	12	7	16	16	7	12	6	12	9	16	16	13	7	3	3	0
9	3	4	7	14	9	16	7	12	10	16	7	16	6	6	16	7	16	10	12	7	16	9	14	7	4	3
10	4	3	9	14	16	8	12	6	16	10	16	7	16	16	7	16	10	16	6	12	8	16	14	9	3	4
11	3	4	7	14	8	13	7	12	7	16	3	16	3	3	16	3	16	7	12	7	13	8	14	7	4	3
12	3	3	7	14	16	8	12	7	16	7	16	10	16	16	10	16	7	16	7	12	8	16	14	7	3	3
13	3	3	10	16	9	13	7	16	6	16	3	16	4	4	16	3	16	6	16	7	13	9	16	10	3	3
14	3	3	10	16	9	13	7	16	6	16	3	16	4	4	16	3	16	6	16	7	13	9	16	10	3	3
15	3	3	7	14	16	8	12	7	16	7	16	10	16	16	10	16	7	16	7	12	8	16	14	7	3	3
16	3	4	7	14	8	13	7	12	7	16	3	16	3	4	16	3	16	7	12	7	13	8	14	7	4	3
17	3	3	9	14	16	8	12	6	16	10	16	7	16	16	7	16	10	16	6	12	8	16	14	9	3	4
18	4	4	7	14	9	16	7	12	10	16	7	16	6	6	16	7	16	10	12	7	16	9	14	7	4	3
19	0	3	3	7	13	16	16	9	12	6	12	7	16	16	7	12	6	12	9	16	16	13	7	3	3	0
20	0	0	3	7	9	14	10	16	7	12	7	12	7	7	12	7	12	7	16	10	14	9	7	3	0	0
21	0	0	3	3	6	9	14	16	16	8	13	8	13	13	8	13	8	16	16	14	9	6	3	3	0	0
22	0	0	3	3	3	6	9	13	9	16	8	16	9	9	16	8	16	9	13	9	6	4	3	3	0	0
23	0	0	0	3	3	3	7	7	14	14	14	14	16	16	14	14	14	14	7	7	3	3	3	0	0	0
24	0	0	0	0	3	3	3	3	7	9	7	7	10	10	7	7	9	7	3	3	4	3	0	0	0	0
25	0	0	0	0	0	0	0	3	4	3	4	3	3	3	3	4	3	4	3	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	4	3	4	3	3	3	4	3	3	3	0	0	0	0	0	0	0	0

The details of the bundle type and bundle names in Cycle 19 reference loading pattern are:

Bundle Type	Bundle Name
1	GE14-P10DNAB405-16GZ-100T-150-T6-2794
2	GE14-P10DNAB405-15G6.0-100T-150-T6-2793
3	GE14-P10DNAB402-10G6.0/4G5.0/1G2.0-100T-150-T6-2905
4	GE14-P10DNAB405-16GZ-100T-150-T6-2906
5	GE14-P10DNAB402-10G6.0/4G5.0/1G2.0-100T-150-T6-2905
6	GNF2-P10DG2B377-13GZ-100T2-150-T6-3073
7	GNF2-P10DG2B379-14GZ-100T2-150-T6-3074
8	GNF2-P10DG2B396-15GZ-100T2-150-T6-3075
9	GNF2-P10DG2B407-6G6.0/6G5.0-100T2-150-T6-3076
10	GNF2-P10DG2B394-13GZ-100T2-150-T6-3077

The details of the bundle type and bundle names in Cycle 20 reference loading pattern are:

Bundle Type	Bundle Name
3	GE14-P10DNAB402-10G6.0/4G5.0/1G2.0-100T-150-T6-2905
4	GE14-P10DNAB405-16GZ-100T-150-T6-2906
6	GNF2-P10DG2B377-13GZ-100T2-150-T6-3073
7	GNF2-P10DG2B379-14GZ-100T2-150-T6-3074
8	GNF2-P10DG2B396-15GZ-100T2-150-T6-3075
9	GNF2-P10DG2B407-6G6.0/6G5.0-100T2-150-T6-3076
10	GNF2-P10DG2B394-13GZ-100T2-150-T6-3077
12	GNF2-P10DG2B378-16GZ-100T2-150-T6-3299
13	GNF2-P10DG2B380-16GZ-100T2-150-T6-3298
14	GNF2-P10DG2B404-12GZ-100T2-150-T6-3297
16	GNF2-P10DG2B390-14GZ-100T2-150-T6-3300

RAI-01 Part c. This question consists of two parts.

Regarding the first part of the question - As for RAI-01 Part b, see the presentation provided by Russ Fawcett, on the basics of how GNF performs fuel cycle core design (provided in Enclosure 3 labeled as Attachment 1).

Regarding the second part of the question - A licensing applicability check is performed on the final core loading pattern and is documented in the Design Record Files. The licensing of the reference loading pattern is applicable to the final loading pattern if the criteria specified in GESTAR II Section 3.4.2 are met. If any of the criteria in GESTAR II Section 3.4.2 are not met, a re-examination of the bases is performed as specified in GESTAR Section 3.4.3, which includes the Safety Limit MCPR. The licensing applicability review ensures that the Supplemental Reload Licensing Report remain valid for the final loading pattern.

NRC RAI-04

The Nuclear Regulatory Commission (NRC) staff has reviewed the July 15, 2010, Entergy submittal of responses to Requests for Additional Information associated with changes to the James A. FitzPatrick (JAF) Nuclear Power Plant Cycle 20 Safety Limit Minimum Critical Power Ratios (SLMCPRs) and has the following question concerning the response to RAI-04 of the submittal:

Please identify how many of the 10x10 (GE14, GNF2) data shown in new Figure 5 are GNF2 data, because new Figure 5 only shows combined data points for GE14 and GNF2.

GNF RESPONSE

For clarity, the entire response to Item 2 of RAI-04 is provided here, augmented to provide information related to this additional request.

The 10x10 GE14 and GNF2 data points from several cases are added to Figure 5. Also updated are the lattice configurations (e.g. 8x8, 9x9, 10x10) of each fuel product line.

The 10x10 (GE14, GNF2) points shown in Figure 5 reflect transition cores with a mix of 10x10 fuel products. Thus, there are not specific GNF2 data points in Figure 5. The table following Figure 5 provides the GE14 and GNF2 batch sizes, and the corresponding [[

                                    ]] for the 10x10 (GE14, GNF2) points in the figure. The table is in ascending order of the abscissa of Figure 5 for ease of correlation to the figure. Sums of batch sizes and [[   ]] may not add to 100% due to rounding and/or the presence of other fuel products in the core.

Figure 5

[[

                                                                              ]]

Table
Figure 5 - 10x10 (GE14, GNF2) Data Points

[[		Batch Fraction (%)		[[	
		GE14	**GNF2**		
		31.0	38.5		
		28.6	71.4		
		64.4	35.6		
		31.0	38.5		
		31.0	38.5		
		64.4	35.6		
		28.6	71.4		
		28.6	71.4		
		67.4	32.6		
		64.4	35.6		
		67.4	32.6		
	]]	67.4	32.6		]]

NRC RAI-05 and RAI-06

RAI-05: Please identify any evaluation reports that the licensee used to reach the conclusion that effect of GNF2 bent spacer wing to Fitzpatrick Cycle 20 operation is minimum. Also, provide technical justification as to why the corner wings are limiting.

RAI-06: Based on the results of the August 10, 2010, audit, the licensee/GE-GNF committed to provide the following documents to support the NRC staff review of this LAR, dated April 21, 2010:
(1) Design Record Files for JAF Cycle 20 final core loading pattern, and SLMCPR calculation including core map to show those bundles experienced 0.1% boiling transition criterion;
(2) Final evaluation report on Part 21 issue regarding to the GNF2 Fuel bent spacer wing;
(3) Core map with identification of the fuel bundles for JAF Cycle 20.

GNF Response

Reference: NRC Audit on Fitzpatrick C20 SLMCPR Tech. Spec. Change letter.
Attendees: Tai Huang (NRC), Tony Attard (NRC), George Rorke (Entergy), Atul Karve (GNF), and Russ Fawcett (GNF).
Time and Place: August 10, 2010, 9.00am to 3.00pm, NEI office at 1776 I Street NW, Suite 400, Washington, DC, 20006

At the audit it was agreed that the following items support the closure of this RAI.
(5) Qualitative explanation (Technical Basis document) of bent spacer wing
(6) Summary of Evaluation Technique (with quantitative numbers)
(7) Number crunching document report for evaluation of bent spacer wing impact on Fitzpatrick C20 SLMCPR.
(8) Core map of % SLMCPR contribution layout for two-loop operation (TLO) and single-loop operation for (SLO) Fitzpatrick C20 (w/o bent flow spacer wing).

Item (1) is provided in Enclosure 3 labeled Attachment 2 (RAI-05 Part 2 and RAI-06 Part 2).

Item (2) is provided in Enclosure 3 labeled Attachment 3 (RAI-05 Part 1).

Item (3) is provided in Enclosure 3 labeled Attachment 4 (RAI-05 Part 1). Further, Attachment 5 of Enclosure 3 provides additional information which supports the position that the bent corner wing are the limiting location (RAI-05 Part 2 and RAI-06 Part 2).

Item (4): (RAI-06 Part 1) The bundle grouping for the TLO SLMCPR calculations is shown in Table RAI-05-1, along with the number of bundles in the group, their contribution to percent number of rods in boiling transition (NRSBT) and the group average exposure. The 2-dimensional map of the bundle groupings is shown in Figure RAI-05-1. The bundle grouping for the SLO SLMCPR calculations is shown in Table RAI-05-2, along with the number of bundles in the group, their contribution to % NRSBT and the group average exposure. The 2-dimensional map of the bundle groupings is shown in Figure RAI-05-2. [[

]] Both the TLO and SLO are [[   ]]

The response to RAI-06 Part 3 is contained with RAI-01.

Table RAI-05-1: Bundle group, # bundles, type, % contribution to NRSBT, and group exposure for TLO.

[[

]]

Figure RAI-05-1: Two-dimensional map of the bundle groupings for percent contribution to NRSBT for TLO.

.[[

]]

Table RAI-05-2: Bundle group, # bundles, type, % contribution to NRSBT, and group exposure for SLO.
[[

]]

Figure RAI-05-2: Two-dimensional map of the bundle groupings for percent contribution to NRSBT for SLO.
[[

]]