

Engineering Change Notice

Complete only applicable items.

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|--|-----------------|--|--------------|
| 3. Document Identifier: CAL-DSU-NU-000012 | 4. Rev.: 00A | 5. Title: PWR Axial Burnup Profile Analysis | 6. ECN: 2 |
| 7. Reason for Change: The purpose of this change is to use the original source reference instead of a data tracking number to remove TBV-5327 from this technical product. | | | |
| 8. Supersedes Change Document: | | <input type="checkbox"/> Yes If, Yes, Change Doc.: _____ <input checked="" type="checkbox"/> No | |
| 9. Change Impact: | | | |
| Inputs Changed: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | Results Impacted: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | |
| Assumptions Changed: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | Design Impacted: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | |
| 10. Description of Change: (Address any "Yes" answers) Changes are as follows: 1. p. 24 - Source should state as follows: Source: ASME 2001 (Section II, Part A, SA-516/SA-516M, Table 1); Density from ASME 2001 (Section II, Part A, SA-20, Section 14.1). 2. pp. 39-40 modified to incorporate additional reference and removal of data tracking number reference. A summary list of attachments is as follows: p. 24 and pp. 39-40. | | | |
| 11. Originator: (Print/Sign/Date) John M. Scaglione <i>John M. Scaglione</i> 8/25/05 | | | |
| Checker: (Print/Sign/Date) Cheng T. Hsu <i>Cheng T. Hsu</i> 8/25/05 | | | |
| Approved: (Print/Sign/Date) William E. Hutchins <i>William E. Hutchins</i> 8/25/05 | | | |

Table 13. Grade 70 A516 Carbon Steel Composition

| Element/Isotope | ZAID ^a | Wt% | Element/Isotope | ZAID | Wt% |
|-----------------|-------------------|--------|-----------------------------------|-----------|---------|
| C-nat | 6000.50c | 0.2700 | Fe-54 | 26054.60c | 5.5558 |
| Mn-55 | 25055.50c | 1.0450 | Fe-56 | 26056.60c | 90.3584 |
| P-31 | 15031.50c | 0.0350 | Fe-57 | 26057.60c | 2.1252 |
| S-32 | 16032.50c | 0.0350 | Fe-58 | 26058.60c | 0.2856 |
| Si-nat | 14000.50c | 0.2900 | Density = 7.850 g/cm ³ | | |

Source: ASME 2001 (Section II, Part A, SA-516/SA-516M, Table 1); Density from ASME 2001 (Section II, Part A, SA-20, Section 14.1)

NOTE: ^a ZAID = MCNP material identifier

The cladding composition was Zircaloy-4 as presented in Table 14 and the spacer grids were Inconel 718 as presented in Table 15. Table 16 presents the component material volume fractions for the upper and lower end-fitting regions and Table 18 presents the upper and lower fuel rod plenum material volume fractions for the B&W 15x15 assembly design. Table 17 presents the upper and lower end-fitting homogenized material compositions and Table 19 presents the upper and lower fuel rod plenum homogenized material compositions for the B&W 15x15 assembly design.

Table 14. Zircaloy-4 Material Composition

| Element/Isotope | ZAID ^a | Wt% | Element/Isotope | ZAID | Wt% |
|-----------------|-------------------|--------|---|-----------|---------|
| Cr-50 | 24050.60c | 0.0042 | Fe-57 | 26057.60c | 0.0045 |
| Cr-52 | 24052.60c | 0.0837 | Fe-58 | 26058.60c | 0.0006 |
| Cr-53 | 24053.60c | 0.0097 | O-16 | 8016.50c | 0.1250 |
| Cr-54 | 24054.60c | 0.0024 | Zr-nat | 40000.60c | 98.1150 |
| Fe-54 | 26054.60c | 0.0119 | Sn-nat | 50000.35c | 1.4500 |
| Fe-56 | 26056.60c | 0.1930 | Density ^b = 6.56 g/cm ³ | | |

Source: ASTM B 811-90 1991, p. 2, Table 2

NOTES: ^a ZAID = MCNP material identifier.

^b From ASM International 1990, p. 666, Table 6.

Table 15. Inconel 718 Material Composition

| Element/Isotope | ZAID ^a | Wt% | Element/Isotope | ZAID | Wt% |
|-----------------|-------------------|---------|-----------------|-----------|---------|
| C-nat | 6000.50c | 0.0400 | Fe-58 | 26058.60c | 0.0537 |
| Si-nat | 14000.50c | 0.1800 | Ni-58 | 28058.60c | 35.2846 |
| S-32 | 16032.50c | 0.0080 | Ni-60 | 28060.60c | 14.0574 |
| Cr-50 | 24050.60c | 0.7940 | Ni-61 | 28061.60c | 0.6214 |
| Cr-52 | 24052.60c | 15.9050 | Ni-62 | 28062.60c | 2.0110 |
| Cr-53 | 24053.60c | 1.8380 | Ni-64 | 28064.60c | 0.5319 |
| Cr-54 | 24054.60c | 0.4652 | Ti-nat | 22000.50c | 0.9001 |
| Mn-55 | 25055.50c | 0.1800 | Al-27 | 13027.50c | 0.5001 |

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Title: PWR Axial Burnup Profile Analysis

Document Identifier: CAL-DSU-NU-000012 REV 00A ECN 2

Page 40 of 41

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