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# 100KE/KW Fuel Storage Basin Surface Volumetric Factors

**K. R. Conn**

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**Abstract:** This Supporting Document presents calculations of surface volumetric factors for the 100KE and 100KW Fuel Storage Basins. These factors relate water level changes to basin loss or additions of water, or the equivalent water displacement volumes of objects added to or removed from the basin.

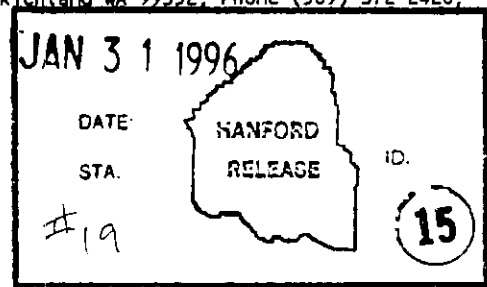
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*K. R. Conn*  
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## I. PURPOSE OF CALCULATION

To determine surface volumetric factors for the 105KE and 105KW Fuel Storage Basins. These factors will provide a correlation between water level change and basin loss (or removal) or addition of water, or water displacement volume of objects removed or added to the basin.

This supporting document supersedes References 1 and 2.

## II. SUMMARY

Based on the calculation results the following nominal values were selected for the surface volumetric factors for both basins with the indicated conditions for discharge chute overflow, main basin water level, and backwash pit overflow and leaktightness. This data is valid for Main Basin water levels between 15ft 6in and 16ft 6in.

### A. Discharge Chute Not Overflowing, or Discharge Chute Overflowing With Main Basin Water Level Above Bottom of Open Slot in Isolation Barrier

1. Backwash Pit not overflowing and not leaktight

Volumetric Factor = 74,300 gal/ft

2. Backwash Pit overflowing, or is leaktight

Volumetric Factor = 73,700 gal/ft

### B. Discharge Chute in Overflow With Main Basin Level Below Bottom of Open Slot in Isolation Barrier

1. Backwash Pit not overflowing and not leaktight

Volumetric Factor = 67,000 gal/ft

2. Backwash Pit overflowing, or is leaktight

Volumetric Factor = 66,400 gal/ft

## III. DISCUSSION

### A. Derivation of Surface Volumetric Factor

The relative water level at the K Basins is measured in the main basin. The quantity of water associated with an indicated change in water level is :

$$\text{Gal} = \Delta L \times \text{VF}$$

where:  $\Delta L$  = change in indicated water level in main basin, ft

VF = volumetric factor (the gallons of water per foot of depth of water at the water surface, gal/ft)

The volumetric factor is calculated from the relationship:

$$VF = \text{Area in ft}^2 \times 7.48053 \text{ gal/ft}^3, \text{ gal/ft}$$

Area is the total surface area of those water volumes in which the water level is directly related to the indicated level in the main basin. If the surface area of a given volume of water is independent of the indicated level in the main basin, either due to being isolated from the main basin or by the characteristics of a specific operational mode, that area is not to be included in the area used to calculate the volumetric factor.

If the surface area is constant with water level then the volumetric factor is constant; however, if the area varies with water level the volumetric factor will vary with water level.

B. Summary of Area Data

Area data for the basins was calculated in Reference 3. It is summarized below for the water level range of 15ft 6in to 16ft 6in. Refer to Reference 3 for information for determining areas at other water levels

Main Basin	8290.0 ft <sup>2</sup>
Discharge Chute	
Water level at 15ft 6in.	952.2 ft <sup>2</sup>
Water level at 16ft 0in.	974.9 ft <sup>2</sup>
Water Level at 16ft 3in.	986.2 ft <sup>2</sup>
Water Level at 16ft 3in. with Discharge Chute Water Level at 16ft 4in.	990.0 ft <sup>2</sup>
Water Level at 16ft 6in.	997.6 ft <sup>2</sup>
Tech View, Weasel, Dummy Elevator and South Loadout Pits and Misc. Items	581.7 ft <sup>2</sup>
North Loadout Pit (Sandfilter Backwash Pit)	
KE Basin	80.2 ft <sup>2</sup>
KW Basin	87.3 ft <sup>2</sup>
Total Area Less Discharge Chute and Backwash Pit	8871.7 ft <sup>2</sup>
Total Area Less Discharge Chute	
KE	8951.9 ft <sup>2</sup>
KW	8959.0 ft <sup>2</sup>

Total Area Including Discharge Chute and Backwash Pit

		<u>Discharge Chute</u>	
		<u>Not in</u>	<u>In</u>
		<u>Overflow</u>	<u>Overflow</u>
KE	Water Level at 15ft 6in	9904.1 ft <sup>2</sup>	9941.9 ft <sup>2*</sup>
	Water Level at 16ft 0in	9926.8 ft <sup>2</sup>	9941.9 ft <sup>2*</sup>
	Water Level at 16ft 3in	9938.1 ft <sup>2</sup>	9941.9 ft <sup>2*</sup>
	Water Level at 16ft 6in	9949.5 ft <sup>2</sup>	**
KW	Water Level at 15ft 6in	9911.2 ft <sup>2</sup>	9949.0 ft <sup>2*</sup>
	Water Level at 16ft 0in	9933.9 ft <sup>2</sup>	9949.0 ft <sup>2*</sup>
	Water Level at 16ft 3in	9945.2 ft <sup>2</sup>	9949.0 ft <sup>2*</sup>
	Water Level at 16ft 6in	9956.6 ft <sup>2</sup>	**

\* - Discharge chute water level assumed to be 16ft 4in

\*\* - The Process Standard maximum limit on Main Basin and Discharge Chute level is 16ft 6in (revision is in process which deletes any maximum limit). In the overflow mode the Discharge Chute level must be slightly greater than the Main Basin level. Thus, if the Main Basin level was at 16ft 6in the Discharge Chute level would exceed the limit. Therefore, it is assumed that the Discharge Chute is not in overflow for these cases.

C. Discussion of Basin Physical and Operational Factors

Isolation barriers were installed between the main basin and the discharge chute in both basins to limit the main basin leakage in the event of a catastrophic failure of the construction joint in the discharge chute. It was a design objective for these barriers to be leaktight. In that case there would be complete isolation between the discharge chute and main basin, and any change in the main basin level would only represent a change in volume of water in the main basin. Any change in level (and volume) in the discharge chute would not effect any change in level in the main basin.

However, the leak tests (References 4 and 5) disclosed that the barriers leak at both basins. Therefore, the basins remain hydraulically connected such that under steady state conditions the levels in the main basin and discharge chute will be in equilibrium, with each changing at the same rate. (If the level is changed in either the main basin or discharge chute by the addition or removal of water, or water displacement volumes, a significant time will be required for equilibrium to be reestablished between the two levels).

The present plan is to operate the discharge chutes in an overflow mode, in which water from the main basin is discharged into the discharge



chute and returned by overflow through the open slot in the isolation barrier.

If the discharge chute is in the overflow mode, and the water level in the main basin is below the bottom of the open slot in the isolation barrier, the main basin and discharge chute are effectively hydraulically disconnected in that the water level in the discharge chute will remain constant (it is assumed that the discharge chute water level would be 16ft 4in) and a change in level indication in the main basin will only represent a change of volume of water in the main basin. However, that change in volume will include any loss (or gain) of water (or water displacement volume) in the discharge chute. (There would be an insignificant second order change in the discharge chute level due to a minute adjustment of the leak and overflow rates as the level differential between the main basin and discharge chute changed).

If the water level in the main basin is above the bottom of the open slot (water level of 16ft 3in) the main basin and discharge chute are essentially hydraulically connected such that under steady state conditions the levels will be in equilibrium and will change at the same rate. The change in main basin level will thus represent a change in volume in both the main basin and discharge chute.

In the discharge chute overflow cases it is not relevant whether the isolation barrier is leaktight or not.

A similar situation exists with the sandfilter backwash pit at the two basins. These pits have a bulkhead (or closed door) to isolate them from the main basins. It is not known whether these closures are leaktight or not. However, there is presently sufficient flow into both pits from valve leakage, sample flow, etc to maintain them in an overflow condition. (The overflow level is above the maximum allowable main basin level). Therefore, the level in the backwash pit remains constant and a change in level in the main basin would only represent a change in volume in the main basin. However, that change in volume would include any loss of water that was occurring in the backwash pit. As long as the backwash pit is overflowing it doesn't matter whether or not the closure is leaktight. If the overflow was stopped, observation of the response of the backwash level would establish whether or not the closure was leaktight. If the closure is leaktight, there would be complete hydraulic isolation between the main basin and the backwash pit. The water level in the pit would be established basically by the previous sandfilter backwash cycle, and subsequent evaporation.

The Process Standard C-303 presently specifies the allowable water level for both the main basin and the discharge chute as 16ft +/- 6in (however, a revision is in process which deletes any maximum limit). The only volume element in which the surface area varies with water level within this level range is the fuel dumping pad in the discharge chute.

The water level is normally maintained near the 16-foot level. The level is not normally allowed to drop significantly below this level. However, during operational activities in which significant quantities of water would be added regularly to the basin, the water level could approach the maximum allowable limit. The volumetric factors will be evaluated over the range of water level from 15ft 6in to 16ft 6in.

#### IV. CALCULATION OF VOLUMETRIC FACTORS

Three basic cases, with 2 subcases each, are considered for determining volumetric surface area factors.

Case 1 - Discharge chute not overflowing (barrier leaks)

- a. Sandfilter backwash pit not overflowing and closure leaks
- b. Sandfilter backwash pit overflowing or closure does not leak

Case 2 - Discharge chute overflowing with main basin water level below the bottom of open slot in the isolation barrier

- a. Sandfilter backwash pit not overflowing and closure leaks
- b. Sandfilter backwash pit overflowing or closure does not leak

Case 3 - Discharge chute overflowing with main basin water level above the bottom of open slot in the isolation barrier.

- a. Sandfilter backwash pit not overflowing and closure leaks
- b. Sandfilter backwash pit overflowing or closure does not leak

#### A. KE Basin

1. Case 1 - Discharge Chute Not Overflowing (isolation barrier leaks)

a. Main Basin Water Level at 15ft 6in

1) Backwash pit not overflowing, closure leaks

Effected area includes discharge chute and backwash pit

$$\text{Area} = 9904.1 \text{ ft}^2, \text{ from above}$$

$$\text{Volumetric factor} = 9904.1 \text{ ft}^2 \times 7.48052 \text{ gal/ft}^3$$

$$= 74,088 \text{ gal/ft}$$

2) Backwash pit in overflow or closure is leaktight

Effected area includes discharge chute but not backwash pit

$$\text{Area} = 9904.1 - 80.2 = 9823.9 \text{ ft}^2$$

$$\text{Volumetric factor} = 9823.9 \times 7.48052 = 73,488 \text{ gal/ft}$$

b. Main Basin Water Level at 16ft 0in

1) Backwash pit not overflowing, closure leaks

Effectuated area includes discharge chute and backwash pit

$$\text{Area} = 9926.8 \text{ ft}^2$$

$$\text{Volumetric factor} = 9926.8 \times 7.48052 = 74,258 \text{ gal/ft}$$

2) Backwash pit in overflow or closure is leaktight

Effectuated area includes discharge chute but not backwash pit

$$\text{Area} = 9926.8 - 80.2 = 9846.6 \text{ ft}^2$$

$$\text{Volumetric factor} = 9846.6 \times 7.48052 = 73,658 \text{ gal/ft}$$

c. Main Basin Water Level at 16ft 3in

1) Backwash pit not overflowing, closure leaks

Effectuated area includes discharge chute and backwash pit

$$\text{Area} = 9938.1 \text{ ft}^2$$

$$\text{Volumetric Factor} = 9938.1 \times 7.48052 = 74,342 \text{ gal/ft}$$

2) Backwash pit in overflow or closure is leaktight

Effectuated area includes discharge chute but not backwash pit

$$\text{Area} = 9938.1 - 80.2 = 9857.9 \text{ ft}^2$$

$$\text{Volumetric factor} = 9857.9 \times 7.48052 = 73,742 \text{ gal/ft}$$

d. Main Basin Water Level at 16ft 6in

1) Backwash pit not overflowing, closure leaks

Effectuated area includes discharge chute and backwash pit

$$\text{Area} = 9949.5 \text{ ft}^2$$

$$\text{Volumetric factor} = 9949.5 \times 7.48052 = 74,427 \text{ gal/ft}$$

2) Backwash pit in overflow or closure is leaktight

Effectuated area includes discharge chute but not backwash pit

$$\text{Area} = 9949.5 - 80.2 = 9869.3 \text{ ft}^2$$

$$\text{Volumetric factor} = 9869.3 \times 7.48052 = 73,827 \text{ gal/ft}$$

2. Case 2 - Discharge Chute Overflowing With Main Basin Water Level Below Bottom of Slot

a. Main Basin Water Level at 15ft 6in to 16ft 3in

1) Backwash pit not overflowing, closure leaks

Effective area includes backwash pit but not discharge chute

$$\text{Area} = 8951.9 \text{ ft}^2$$

$$\text{Volumetric factor} = 8951.9 \times 7.48052 = 66,965 \text{ gal/ft}$$

2) Backwash pit overflowing or closure is leaktight

Effective area does not include discharge chute or backwash pit

$$\text{Area} = 8951.9 - 80.2 = 8871.7 \text{ ft}^2$$

$$\text{Volumetric factor} = 8871.7 \times 7.48052 = 66,365 \text{ gal/ft}$$

3. Case 3 - Discharge Chute Overflowing With Main Basin Water Level Above Bottom of Slot

a. Basin Water Level at 16ft 3in, Discharge Chute Water Level at 16ft 4in

1) Backwash pit not overflowing, closure leaks

Effective area includes discharge chute and backwash pit

$$\text{Area} = 9941.9 \text{ ft}^2$$

$$\text{Volumetric factor} = 9941.9 \times 7.48052 = 74,371 \text{ gal/ft}$$

2) Backwash pit in overflow or closure is leaktight

Effective area includes discharge chute but not backwash pit

$$\text{Area} = 9941.9 - 80.2 = 9861.7 \text{ ft}^2$$

$$\text{Volumetric factor} = 9861.7 \times 7.48052 = 73,771 \text{ gal/ft}$$

b. Basin Water Level at 16ft 6in

The discharge chute overflow case is not included because it would be necessary for the water level in the discharge chute to be above the Process Standard limit of 16ft 6in. for return flow to the main basin

through the open slot. The volumetric factors would be essentially the same as Case 1.

1) Backwash pit not overflowing, closure leaks

Volumetric factor = 74,427 gal/ft

2) Backwash pit overflowing or closure is leaktight

Volumetric factor = 73,827 gal/ft

B. KW Basin

The only difference between KE and KW is the North Loadout Pit (or Backwash Pit) area. Therefore, only those cases in which it is assumed that the backwash pit is not overflowing and is not leaktight are affected. For all other cases the volumetric factors for KW are the same as for KE.

1. Case 1 - Discharge Chute Not Overflowing

a. Main Basin Water Level at 15ft 6in

1) Backwash pit not overflowing, closure leaks

Effectuated area includes discharge chute and backwash pit

$$\text{Area} = 9911.2 \text{ ft}^2$$

$$\text{Volumetric factor} = 9911.2 \text{ ft}^2 \times 7.48052 \text{ gal/ft}^3$$

$$= 74,141 \text{ gal/ft}$$

2) Backwash pit overflowing or closure is leaktight

Same as KE - Volumetric factor = 73,488 gal/ft

b. Main Basin Water Level at 16ft 0in

1) Backwash pit not overflowing, closure leaks

Effectuated area includes discharge chute and backwash pit

$$\text{Area} = 9933.9 \text{ ft}^2$$

$$\text{Volumetric factor} = 9933.9 \times 7.48052 = 74,311 \text{ gal/ft}$$

2) Backwash pit in overflow or closure is leaktight

Same as KE - Volumetric factor = 73,658 gal/ft

c. Main Basin Water Level at 16ft 3in

1) Backwash pit not overflowing, closure leaks

Effectuated area includes discharge chute and backwash pit

$$\text{Area} = 9945.2 \text{ ft}^2$$

$$\text{Volumetric Factor} = 9945.2 \times 7.48052 = 74,395 \text{ gal/ft}$$

2) Backwash pit overflowing or closure is leaktight

Same as KE - Volumetric factor = 73,742 gal/ft

d. Main Basin Water Level at 16ft 6in

1) Backwash pit not overflowing, closure leaks

Effectuated area includes discharge chute and backwash pit

$$\text{Area} = 9956.6 \text{ ft}^2$$

$$\text{Volumetric factor} = 9956.6 \times 7.48052 = 74,481 \text{ gal/ft}$$

2) Backwash pit overflowing or closure is leaktight

Same as KE - Volumetric factor = 73,827 gal/ft

2. Case 2 - Discharge Cute Overflowing With Main Basin Water Level Below Bottom of Slot

a. Main Basin Water Level at 15ft 6in to 16ft 3in

1) Backwash pit not overflowing, closure leaks

Effective area includes backwash pit but not discharge chute

$$\text{Area} = 8959.0 \text{ ft}^2$$

$$\text{Volumetric factor} = 8959.0 \times 7.48052 = 67,018 \text{ gal/ft}$$

2) Backwash pit overflowing or closure is leaktight

Same as KE - Volumetric factor = 66,365 gal/ft

3. Case 3 - Discharge Chute Overflowing With Main Basin Water Level Above Bottom of Slot

a. Basin Water Level at 16ft 3in, Discharge Chute Water Level at 16ft 4in

1) Backwash pit not overflowing, closure leaks

Effective area includes discharge chute and backwash pit

$$\text{Area} = 9949.0 \text{ ft}^2$$

$$\text{Volumetric factor} = 9949.0 \times 7.48052 = 74,425 \text{ gal/ft}$$

2) Backwash pit overflowing or closure is leaktight

Same as KE - Volumetric factor = 73,771 gal/ft

b. Basin Water Level at 16ft 6in

Same as Case 1 (see KE Case 3)

1) Backwash pit not overflowing, closure leaks

Volumetric factor = 74,481 gal/ft

2) Backwash pit not overflowing or closure is leaktight

Volumetric factor = 73,827 gal/ft

C. Summary of Volumetric Factors

	<u>KE</u> gal/ft	<u>KW</u> gal/ft
1. <u>Case 1 - Discharge Chute Not in Overflow (barrier leaks)</u>		
a. BKWH Pit not overflowing (closure leaks)		
15ft 6in water level	74,088	74,141
16ft water level	74,258	74,311
16ft 3in water level	74,342	74,395
16ft 6in water level	74,427	74,481
b. BKWH Pit in overflow, or closure is leaktight		
15ft 6in water level	73,488	73,488
16ft water level	73,658	73,658
16ft 3in water level	73,742	73,742
16ft 6in water level	73,827	73,827

		<u>KE</u>	<u>KW</u>
		gal/ft	gal/ft
2.	<u>Case 2 - Discharge Chute Overflowing With Main Basin Water Level Below Bottom of Slot</u>		
a.	BKWH Pit not overflowing (closure leaks) 15ft 6in to 16ft 3in. water level	66,965	67,018
b.	BKWH Pit in overflow, or closure is leaktight 15ft 6in to 16ft 3in. water level	66,365	66,365
3.	<u>Case 3 - Discharge Chute Overflowing With Main Basin Water Level Above Bottom of Slot</u>		
a.	BKWH Pit not overflowing (closure leaks) 16ft 3in water level 16ft 6in water level	74,371 74,427	74,425 74,481
b.	BKWH Pit overflowing, or closure is leaktight 16ft 3in water level 16ft 6in water level	73,771 73,827	73,771 73,827

In all cases a change in level in the main basin will reflect any gain or loss of water (or water displacement volumes) in the discharge chute. In the b) cases a change of level in the main basin will also reflect any gain or loss of water from the north loadout (sandfilter backwash) pit if the pit is overflowing, but not if the pit is not overflowing but is leaktight.

The difference between the factors without discharge chute overflow (case 1) and with overflow with the main basin water level above the bottom of the overflow slot (case 3) is less than 0.2%. Also, the effect of water level is very small (less than 0.5% between 15ft 6 in and 16ft 6in factors). Therefore, the cases considered above are reduced to the following 4 basic cases, with nominal values selected for the volumetric factors.

D. Selected Volumetric Factors

1. Discharge Chute not overflowing, or Discharge Chute in overflow with Main Basin water level above bottom of open slot in isolation barrier
  - a. Backwash Pit not overflowing and not leaktight  
Volumetric Factor = 74,300 gal/ft
  - b. Backwash Pit overflowing, or is leaktight  
Volumetric Factor = 73,700 gal/ft



2. Discharge Chute in overflow with main basin level below bottom of open slot in isolation barrier
  - a. Backwash Pit not overflowing and not leaktight  
Volumetric Factor = 67,000 gal/ft
  - b. Backwash Pit overflowing, or is leaktight  
Volumetric Factor = 66,400 gal/ft

The use of these factors will result in error of less than 0.5%.

If the discharge chute isolation barriers were made leaktight, only the volumetric factor for the case of no discharge chute overflow with the main basin water below the bottom of the open slot in the barrier would be affected. This case would be the same as the case of discharge chute with overflow with the main basin level below the bottom of the slot. Thus, the volumetric factor would be either 67,000 gal/ft or 66,400 gal/ft, depending upon the overflow or leakage condition of the backwash pit. However, in this situation any loss or gain of water, or water displacement volumes, in the discharge chute would not effect any change in the main basin water level.

#### V. REFERENCES

1. Memo 93KRCTDJ.001, Safety Technical Support and N Reactor Engineering to J. P. Schmidt, KE/KW Storage Basin Water Area and Volumetric Factor, March 29, 1993.
2. WHC-SD-NR-ANAL-004, 100KE/KW Basin Water Surface Area Calculation, L. D. Alwardt, May 9, 1991.
3. WHC-SD-SNF-ANAL-003, 100KE/KW Fuel Storage Basin Area and Volume Data, K. R. Conn, Jan 18, 1996.
4. WHC-SD-SNF-TRP-007, 105K West Isolation Barrier Acceptance Analysis Report, K. J. McCracken and J. J. Irwin, May 18, 1995.
5. WHC-SD-SNF-TRP-006, 105K East Isolation Barrier Acceptance Analysis Report, K. J. McCracken and J. J. Irwin, May 31, 1995.

Document Checked - Number: WHC-SD-SNF-ANAL-004 Revision: 0

Title: LOOKE/KW FUEL STORAGE BASIN VOLUMETRIC FACTORS

- | Yes                                 | No                       | N/A                                 |  |
|-------------------------------------|--------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Problem completely defined.  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Appropriate analytical method used.  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Necessary assumptions are appropriate, explicitly stated, and supported.                                     |
| <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Computer codes and data files documented.  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Data used in calculations explicitly stated in document.   |
| <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Sources of non-standard formulae/data are referenced and the correctness of the reference verified.          |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Data checked for consistency with original source information as applicable.                                 |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Mathematical derivations checked including dimensional consistency of results.                               |
| <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Models appropriate and used within range of validity or use outside range of established validity justified. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Hand calculations checked for errors.  |
| <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Code run streams correct and consistent with analysis documentation.   |
| <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Code output consistent with input and with results reported in analysis documentation.                       |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Acceptability limits on analytical results applicable and supported. Limits checked against sources.         |
| <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Safety margins consistent with good engineering practices.   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Conclusions consistent with analytical results and applicable limits.  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | Results and conclusions address all points required in the problem statement.                                |

I have checked the analysis/calculation and it is complete and accurate to the best of my knowledge.

David J. Howard      1/22/96  
engineer/checker      date

Note: Any hand calculations, notes, or summaries generated as part of this check should be signed, dated, and attached to this checklist. Material should be labeled and recorded so that it is intelligible to a technically qualified third party.

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