

**DEC 1 0 2001**

10 CFR 50.90

SERIAL: BSEP 01-0142  
TSC-2001-11

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1  
DOCKET NO. 50-325/LICENSE NO. DPR-71  
ADDITIONAL INFORMATION SUPPORTING A REQUEST FOR LICENSE  
AMENDMENT REGARDING REVISION OF MINIMUM CRITICAL POWER RATIO  
SAFETY LIMIT VALUES (NRC TAC NO. MB2952)

Ladies and Gentlemen:

On September 18, 2001 (Serial: BSEP 01-0104), Carolina Power & Light (CP&L) Company submitted a license amendment application to revise the Technical Specifications for the Brunswick Steam Electric Plant, Unit 1. The license amendment application provides proposed revisions to the Minimum Critical Power Ratio (MCPR) Safety Limit values for single and two recirculation loop operation.

Enclosure 2 of the license amendment application provided information, prepared by Global Nuclear Fuel - Americas, LLC (GNF-A), summarizing the relevant input parameters and providing results of comparisons of the Unit 1 Cycle 13 and Unit 1 Cycle 14 MCPR Safety Limit values. This information was considered to be proprietary to GNF-A; therefore, an affidavit to support withholding from public disclosure in accordance with 10 CFR 9.17(a)(4) and 10 CFR 2.790(a)(4) was also provided.

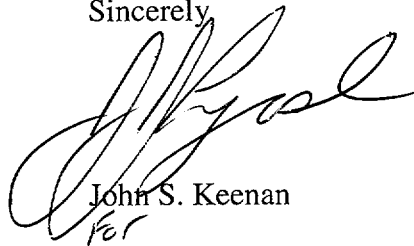
In telephone discussions with the NRC Project Manager assigned to BSEP, Units 1 and 2, CP&L was informed that the NRC had recently questioned the proprietary classification of certain similar technical information prepared by GNF-A for the Monticello Nuclear Generating Plant and that GNF-A had subsequently revised their proprietary information. As a result of the Monticello questions, GNF-A has also revised the information previously submitted as part of Enclosure 2 of CP&L's September 18, 2001, submittal. Enclosure 1 of this letter provides a complete replacement for Enclosure 2 of the September 18, 2001, submittal. The previously submitted information should either be destroyed or returned to GNF-A. The information contained in Enclosure 1 is considered to be proprietary to GNF-A and should be withheld from public disclosure in accordance with 10 CFR 9.17(a)(4) and 10 CFR 2.790(a)(4). An affidavit attesting to this fact is provided

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in Enclosure 2. A non-proprietary version of the revised GNF-A information is provided in Enclosure 3.

Please refer any questions regarding this submittal to Mr. David C. DiCello, Manager - Regulatory Affairs, at (910) 457-2235.

Sincerely,



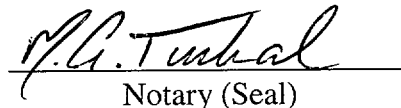
John S. Keenan  
for

WRM/wrm

Enclosures:

1. Global Nuclear Fuel - Americas, LLC Document Entitled "Additional Information Regarding the Cycle Specific SLMCPR for Brunswick Unit 1 Cycle 14" **(Proprietary Information)**
2. Global Nuclear Fuel - Americas, LLC Affidavit Regarding Withholding From Public Disclosure
3. Global Nuclear Fuel - Americas, LLC Document Entitled "Additional Information Regarding the Cycle Specific SLMCPR for Brunswick Unit 1 Cycle 14" **(Non-Proprietary Version)**

Jeffery J. Lyash, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, and agents of Carolina Power & Light Company.



Notary (Seal)

My commission expires: *May 18, 2003*

cc (with enclosures):

U. S. Nuclear Regulatory Commission, Region II  
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Global Nuclear Fuel - Americas, LLC  
ATTN: Mr. Glen A. Watford  
Castle Hayne Road  
Wilmington, NC 28401

cc (without Enclosure 1):

Ms. Jo A. Sanford  
Chair - North Carolina Utilities Commission  
P.O. Box 29510  
Raleigh, NC 27626-0510

Mr. Mel Fry  
Director - Division of Radiation Protection  
North Carolina Department of Environment and Natural Resources  
3825 Barrett Drive  
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ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1  
DOCKET NO. 50-325/LICENSE NO. DPR-71  
ADDITIONAL INFORMATION SUPPORTING A  
REQUEST FOR LICENSE AMENDMENT REGARDING  
REVISION OF MINIMUM CRITICAL POWER RATIO SAFETY LIMIT VALUES  
(NRC TAC NO. MB2952)

Global Nuclear Fuel - Americas, LLC Affidavit  
Regarding Withholding From Public Disclosure



**Global Nuclear Fuel**

A Joint Venture of GE, Toshiba, & Hitachi

**Affidavit**

**I, Glen A. Watford**, being duly sworn, depose and state as follows:

- (1) I am Manager, Fuel Engineering Services, Global Nuclear Fuel – Americas, L.L.C. (“GNF-A”) and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.
- (2) The information sought to be withheld is contained in the attachment, “Additional Information Regarding the Cycle Specific SLMCPR for Brunswick Unit 1 Cycle 14,” October 29, 2001.
- (3) In making this application for withholding of proprietary information of which it is the owner or licensee, GNF-A relies upon the exemption from disclosure set forth in the Freedom of Information Act (“FOIA”), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4) and 2.790(a)(4) for “trade secrets and commercial or financial information obtained from a person and privileged or confidential” (Exemption 4). The material for which exemption from disclosure is here sought is all “confidential commercial information,” and some portions also qualify under the narrower definition of “trade secret,” within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).
- (4) Some examples of categories of information which fit into the definition of proprietary information are:
  - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by GNF-A’s competitors without license from GNF-A constitutes a competitive economic advantage over other companies;
  - b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;
  - c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of GNF-A, its customers, or its suppliers;
  - d. Information which reveals aspects of past, present, or future GNF-A customer-funded development plans and programs, of potential commercial value to GNF-A;
  - e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a. and (4)b., above.

- (5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GNF-A, and is in fact so held. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in (6) and (7) following. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GNF-A, no public disclosure

has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.

- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or subject to the terms under which it was licensed to GNF-A. Access to such documents within GNF-A is limited on a "need to know" basis.
- (7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GNF-A are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.
- (8) The information identified in paragraph (2) is classified as proprietary because it contains details of GNF-A's fuel design and licensing methodology.

The development of the methods used in these analyses, along with the testing, development and approval of the supporting methodology was achieved at a significant cost, on the order of several million dollars, to GNF-A or its licensor.

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GNF-A's competitive position and foreclose or reduce the availability of profit-making opportunities. The fuel design and licensing methodology is part of GNF-A's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical, and NRC review costs comprise a substantial investment of time and money by GNF-A or its licensor.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GNF-A's competitive advantage will be lost if its competitors are able to use the results of the GNF-A experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GNF-A would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GNF-A of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing and obtaining these very valuable analytical tools.

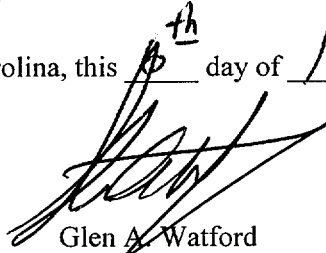
Affidavit

State of North Carolina     )  
County of New Hanover    )     SS:

Glen A. Watford, being duly sworn, deposes and says:

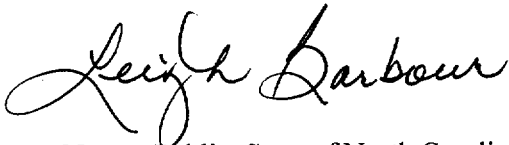
That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at Wilmington, North Carolina, this 10<sup>th</sup> day of November, 2001



Glen A. Watford  
Global Nuclear Fuel – Americas, LLC

Subscribed and sworn before me this 6<sup>th</sup> day of November, 2001



Notary Public, State of North Carolina

My Commission Expires February 6, 2006

ENCLOSURE 3

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1  
DOCKET NO. 50-325/LICENSE NO. DPR-71  
ADDITIONAL INFORMATION SUPPORTING A  
REQUEST FOR LICENSE AMENDMENT REGARDING  
REVISION OF MINIMUM CRITICAL POWER RATIO SAFETY LIMIT VALUES  
(NRC TAC NO. MB2952)

Global Nuclear Fuel - Americas, LLC  
Document Entitled "Additional Information Regarding the  
Cycle Specific SLMCPR for Brunswick Unit 1 Cycle 14"  
**(Non-Proprietary Version)**



**References**

- [1] Letter, Frank Akstulewicz (NRC) to Glen A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, *Methodology and Uncertainties for Safety Limit MCPR Evaluations*; NEDC-32694P, *Power Distribution Uncertainties for Safety Limit MCPR Evaluation*; and Amendment 25 to NEDE-24011-P-A on Cycle Specific Safety Limit MCPR," (TAC Nos. M97490, M99069 and M97491), March 11, 1999.
- [2] Letter, Thomas H. Essig (NRC) to Glen A. Watford (GE), "Acceptance for Referencing of Licensing Topical Report NEDC-32505P, Revision 1, *R-Factor Calculation Method for GE11, GE12 and GE13 Fuel*," (TAC Nos. M99070 and M95081), January 11, 1999.
- [3] *General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation and Design Application*, NEDO-10958-A, January 1977.
- [4] Letter, Glen A. Watford (GNF-A) to U. S. Nuclear Regulatory Commission Document Control Desk with attention to R. Pulsifer (NRC), "Confirmation of 10x10 Fuel Design Applicability to Improved SLMCPR, Power Distribution and R-Factor Methodologies", FLN-2001-016, September 24, 2001.
- [5] Letter, Glen A. Watford (GNF-A) to U. S. Nuclear Regulatory Commission Document Control Desk with attention to J. Donoghue (NRC), "Confirmation of the Applicability of the GEXL14 Correlation and Associated R-Factor Methodology for Calculating SLMCPR Values in Cores Containing GE14 Fuel", FLN-2001-017, October 1, 2001.

**Comparison of Brunswick Unit 1 Cycle 14 SLMCPR Value**

Table 1 summarizes the relevant input parameters and results of the safety limit MCPR (SLMCPR) determination for the Brunswick Unit 1 Cycle 14 and Cycle 13 cores. The SLMCPR evaluations were performed using NRC approved methods and uncertainties<sup>[1]</sup>. These evaluations yield different calculated SLMCPR values because different inputs were used. The quantities that have been shown to have some impact on the determination of the SLMCPR are provided.

In comparing the Brunswick Unit 1 Cycle 14 and Cycle 13 SLMCPR values it is important to note the impact of the differences in the core and bundle designs. These differences are summarized in Table 1.

In general, the calculated safety limit is dominated by two key parameters: (1) flatness of the core bundle-by-bundle MCPR distributions and (2) flatness of the bundle pin-by-pin power/R-factor distributions. Greater flatness in either parameter yields more rods susceptible to boiling transition and thus a higher calculated SLMCPR.

[[ ]]

The uncontrolled bundle pin-by-pin power distributions were compared between the Brunswick Unit 1 Cycle 14 bundles and the Cycle 13 bundles. Pin-by-pin power distributions are characterized in terms of R-factors using the NRC approved methodology<sup>[2]</sup>. For the Brunswick Unit 1 Cycle 14 limiting case analyzed at EOR-2K, [[ ]] the Brunswick Unit 1 Cycle 14 bundles are flatter than the bundles used for the Cycle 13 SLMCPR analysis.

**Summary**

[[ ]] have been used to compare quantities that impact the calculated SLMCPR value. Based on these comparisons, the conclusion is reached that the Brunswick Unit 1 Cycle 14 core/cycle has a flatter core MCPR distribution [[ ]] and flatter in-bundle power distributions [[ ]] than what was used to perform the Cycle 13 SLMCPR evaluation.

The calculated 1.12 Monte Carlo SLMCPR for Brunswick Unit 1 Cycle 14 is consistent with what one would expect [[ ]] the 1.12 SLMCPR value is appropriate.

Based on all of the facts, observations and arguments presented above, it is concluded that the calculated SLMCPR value of 1.12 for the Brunswick Unit 1 Cycle 14 core is appropriate. It is reasonable that this value is larger than the 1.10 value calculated for the previous cycle.

For single loop operations (SLO) the calculated safety limit MCPR for the limiting case is 1.14 as determined by specific calculations for Brunswick Unit 1 Cycle 14.

**Supporting Information**

The following information is provided in response to NRC questions on similar submittals regarding changes in Technical Specification values of SLMCPR. NRC questions pertaining to how GE14 applications satisfy the conditions of the NRC SER<sup>[1]</sup> have been addressed in Reference [4]. Other generically applicable questions related to application of the GEXL14 correlation and the applicable range for the R-factor methodology are addressed in Reference [5]. Only those items that require a plant/cycle specific response are presented below since all the others are contained in the references that have already been provided to the NRC.

The core loading information for Brunswick Unit 1 Cycle 13 and 14 is provided in Figures 1 and 2, respectively. The impact of the fuel loading pattern differences on the calculated SLMCPR is correlated to the values of [[ ]] The power and non-power distribution uncertainties that are used in the analyses are indicated in Table 1.

Prepared by:

Verified by:

G.M. Baka  
Technical Project Manager  
Brunswick Unit 1 Project

E.W. Gibbs  
Technical Project Manager  
Global Nuclear Fuel - Americas

Table 1

Comparison of the Brunswick Unit 1 Cycle 14 and Cycle 13 SLMCPR

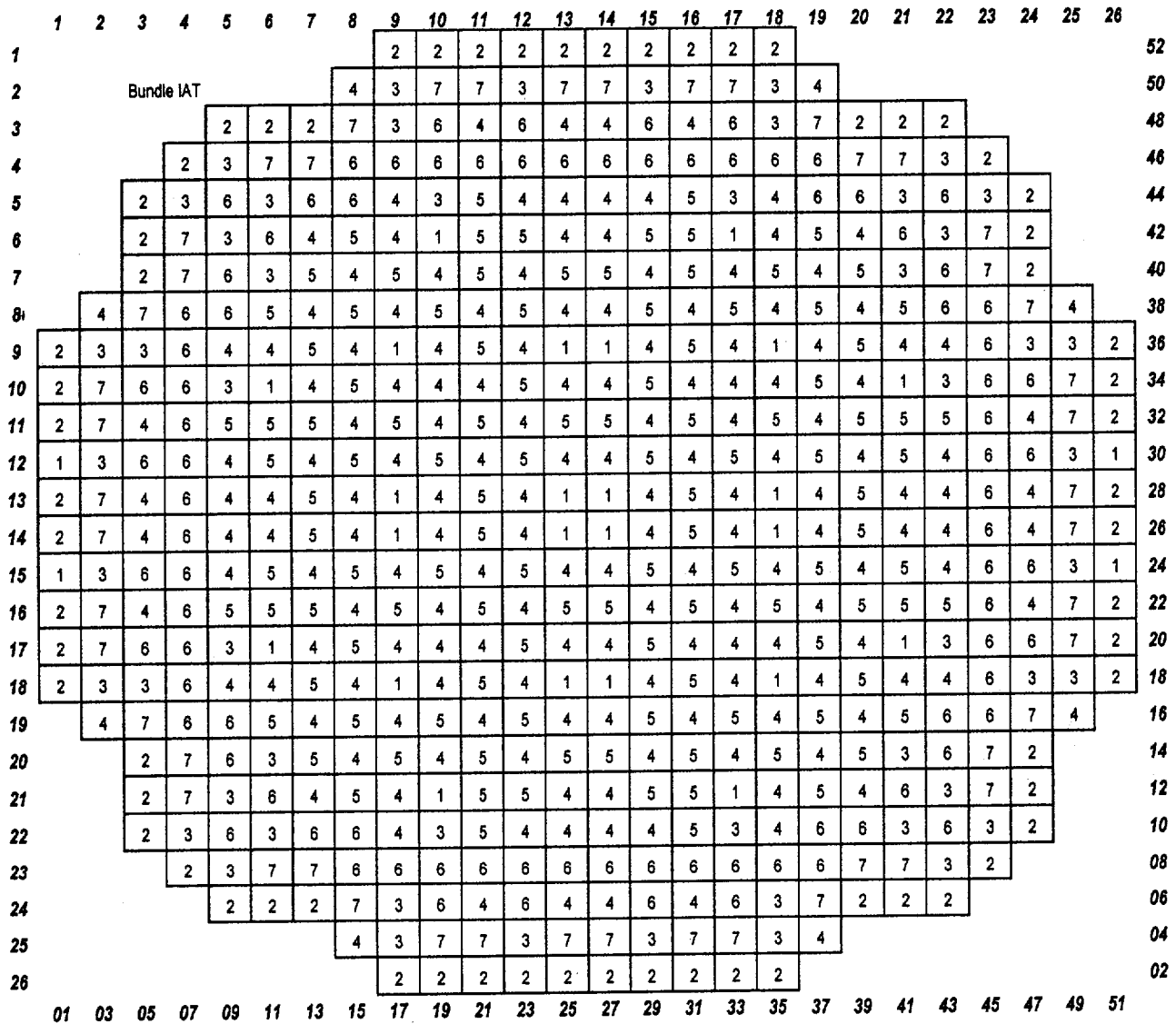
QUANTITY, DESCRIPTION	Brunswick Unit 1 Cycle 13	Brunswick Unit 1 Cycle 14
Number of Bundles in Core	560	560
Limiting Cycle Exposure Point	EOR-1K	EOR-2K
Cycle Exposure at Limiting Point [MWd/STU]	14560	13513
Reload Fuel Type	GE13	GE14
Latest Reload Batch Fraction [%]	39.3%	44.3%
Latest Reload Average Batch Weight % Enrichment	4.03%	4.23%
Batch Fraction for GE14	0.0%	44.3%
Batch Fraction for GE13	100.0%	55.7%
Core Average Weight % Enrichment	3.97%	4.12%
Core MCPR (for limiting rod pattern)	1.39	1.48
[[		]]
[[		]]
Power distribution uncertainty	GETAB	GETAB
Non-power distribution uncertainty	Revised	Revised
Calculated Safety Limit MCPR	1.10	1.12

Figure 1 Reference Core Loading Pattern – Cycle 13

	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									19	19	19	20	19	19	20	19	19	19										52
2									19	1	1	2	1	3	3	1	2	1	1	19								50
3																												48
4																												46
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	01	03	05	07	09	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51		

Bundle Name	IAT	# in Core	# Fresh	Cycle Loaded
GE13-P9DTB403-5G6.0/7G5.0-100T-146-T	1	36	0	12
GE13-P9DTB403-7G6.0/7G5.0-100T-146-T	2	160	0	12
GE13-P9DTB405-5G6.0/7G5.0-100T-146-T	3	52	52	13
GE13-P9DTB402-13G6.0/1G2.0-100T-146-T	4	168	168	13
GE13-P9DTB380-10G5.0A-100T-146-T	19	96	0	11
GE13-P9DTB380-11G5.0A-100T-146-T	20	48	0	11
Total		560	220	

Figure 2 Reference Core Loading Pattern – Cycle 14



Bundle Name	IAT	# in Core	# Fresh	Cycle Loaded
GE13-P9DTB403-5G6.0/7G5.0-100T-146-T	1	28	0	12
GE13-P9DTB403-7G6.0/7G5.0-100T-146-T	2	64	0	12
GE13-P9DTB405-5G6.0/7G5.0-100T-146-T	3	52	0	13
GE13-P9DTB402-13G6.0/1G2.0-100T-146-T	4	168	0	13
GE14-P10DNAB416-17GZ-100T-150-T-2496	5	112	112	14
GE14-P10DNAB425-16GZ-100T-150-T-2497	6	88	88	14
GE14-P10DNAB438-12G6.0-100T-150-T-2498	7	48	48	14
Total		560	248	