The Honorable Theresa L. Fricke

UNITED STATES DISTRICT COURT FOR THE
WESTERN DISTRICT OF WASHINGTON
AT TACOMA

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| UNITED STATES OF AMERICA,<br>Plaintiff<br><br>v.<br><br>ELAINE MARIE THOMAS,<br>Defendant. | CASE NO. 3:20-mj-05145<br><br>**COMPLAINT for VIOLATION**<br><br>Title 18 U.S.C. § 1031<br>(Major Fraud Against the United States) |

BEFORE, Theresa L. Fricke, United States Magistrate Judge, United States Courthouse, Tacoma, Washington.

The undersigned complainant, being duly sworn, states:

## COUNT 1
## (Major Fraud Against the United States)

### A. Background

1. Between 1977 and May 2017, defendant ELAINE THOMAS ("THOMAS") worked as a metallurgist for a steel foundry in Tacoma, Washington (the "Tacoma Foundry"). The Tacoma Foundry was owned and operated by Atlas Castings &



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Technology until 2007, when it was acquired by Americast. Bradken, Inc. acquired the Tacoma Foundry in 2008 and has operated it since that time.

2. The Tacoma Foundry is the leading supplier of certain high-yield steel castings used to construct naval submarines. In particular, the Tacoma Foundry produces castings made of "HY-80" or "HY-100" high-yield steel. Bradken produces these castings as a subcontractor or supplier for companies that contract directly with the United States Navy. The value of the contracts between the contractors and the Navy substantially exceed $1 million for each submarine.

3. The HY-80 and HY-100 castings produced by the Tacoma Foundry are critical components of the submarines on which they are installed, and some of the castings form a part of the hull. As a result, it is critical that the mechanical properties of the castings (such as strength and toughness) meet rigorous specifications. These specifications are currently set forth in a publication known as "Tech Pub 300," and were previously contained in a publication known as "Military Specification 23008." The Tech Pub 300 and Military Specification 23008 specifications will collectively be referred to below to as "the Specifications."

4. Each production of molten steel is known as a "heat." Each heat produces one or more castings, as well as test blocks, which are specimens of the steel used to test the characteristics of the steel in that heat. When the Tacoma Foundry delivers a casting to a prime contractor, it is required to report and certify the test results for the heat from which the casting was produced. The prime contractor, in reliance on those certifications, in turn certifies to the Navy that the submarine, including the components produced by the Tacoma Foundry, satisfies the Specifications. The Navy relies on these certifications in accepting submarines for service and making payments to the prime contractor.

5. The Specifications require the Tacoma Foundry to perform certain tests on each heat. One of the required tests is known as the "Charpy V-notch" test. The Charpy V-notch test evaluates the toughness of the steel, that is, the amount of dynamic force the steel can withstand. The test involves striking a specimen from the test block with a



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heavy pendulum and testing how much energy the specimen absorbs when it breaks. One type of Charpy V-notch test involves cooling the specimen to -100 degrees Fahrenheit. The Specifications require the foundry to perform three -100°F Charpy V-notch tests for each heat, and further require that the average result for the three tests be no less than 50 foot-pounds, with no single value below 45 foot-pounds. If a casting does not satisfy the Specifications' Charpy-V notch requirements, this increases the risk that the component could fail under certain circumstances, such as a collision or a shock event, which may occur during wartime scenarios.

6. The Specifications also require a second test called the "tensile" test. Tensile tests determine how steel will perform under tension load. This involves pulling a tensile bar to its breaking point to determine the strength of the material. HY-80 steel must be strong enough to withstand 80,000 pounds of force per square inch (psi). HY-100 steel must be strong enough to withstand 100,000 psi. Accordingly, in order to meet the Specifications, an HY-80 heat must return test results between 80 and 99.5 kips per square inch (ksi) (1 ksi equals 1,000 psi). HY-100 steel must return test results between 100 and 120 ksi. If a casting does not satisfy the Specifications' tensile requirements, the safety of the vessel is reduced because the vessel's design relies on those specified properties to show that the vessel can safely perform routine operations and withstand shock events.

7. The Tacoma Foundry conducts metallurgical testing in its metallurgical laboratory, which is overseen by the Director of Metallurgy. The Director of Metallurgy is responsible for ensuring that the steel meets the Navy's technical requirements, including the Specifications. The Director of Metallurgy must complete a "Certified Metallurgical Test Report" for each heat setting out the test results and affirming that the heat was tested in accordance with the Specifications.

8. Between 1977 and May 22, 2017, THOMAS served as a metallurgist, Metallurgy Lab Supervisor, Metallurgy Services Manager, and, from 2009 on, as Director of Metallurgy, for the Tacoma Foundry. THOMAS's responsibilities included



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reviewing test results, determining whether those results complied with the Specifications, and then submitting and certifying the results to the prime contractor.

9. During THOMAS's tenure, when Tacoma Foundry lab personnel performed a test, they typically recorded the test results on a notecard. THOMAS or other lab personnel then copied the test results into a database known as "AS400." After 2008, test results were also entered into a second database known as "B&L." THOMAS used the test results recorded in B&L when submitting certifications to the prime contractor.

**B. The Scheme and Artifice to Defraud**

10. Between approximately 1985 and May 22, 2017, in connection with the procurements described above, ELAINE MARIE THOMAS knowingly devised and executed a scheme with the intent to defraud the United States Navy, and to obtain money and property by means of materially false and fraudulent pretenses and representations. Specifically, THOMAS falsely represented to the prime contractors that certain high-yield steel castings manufactured by the Tacoma Foundry complied with the Specifications, when in fact, as THOMAS well knew, the test results for approximately half of the HY-80 and HY-100 castings failed to meet the Specifications.

11. THOMAS made these representations knowing that the prime contractors would rely on them in certifying to the Navy that the submarines, including the components manufactured by the Tacoma Foundry, complied with the Specifications. THOMAS's false representations caused the United States Navy to make contract payments that the Navy would not have made if it had known the true characteristics of the steel produced by the Tacoma Foundry. Furthermore, THOMAS's false statements and misrepresentations caused the prime contractor to install substandard components on naval submarines, and caused the Navy to accept those submarines and place them into service, thereby potentially placing naval personnel and naval operations at risk.



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**C. Manner and Means**

It was part of the scheme to defraud that:

**1. The Fraudulent Certifications**

12. In cases where the Tacoma Foundry's lab personnel recorded failing Charpy V-notch test results on testing notecards, THOMAS altered the notecards to change the recorded Charpy V-notch results from a failing value to a passing value. THOMAS would sometimes change the first digit of the test results on the notecard to increase the result by ten or twenty foot-pounds from a failing value to a passing value. For example, if the test returned a value of 37 foot-pounds (a failing value), THOMAS would alter the 3 so that it appeared to be a 5, creating the false appearance that the test result was 57 foot-pounds.

13. Similarly, in cases where the Tacoma Foundry's lab personnel recorded failing tensile test results on a notecard, THOMAS altered the test cards to make it appear that the test had returned passing results. For example, in cases where an HY-80 heat returned a tensile value between 70 and 79 ksi (a failing value), THOMAS would convert the first digit (the 7) to an 8, creating the appearance that the test had returned a passing result of 80 ksi or greater.

14. THOMAS typically entered the accurate (non-passing) test results into the AS400 database, but entered the falsified (passing) results into the B&L database. THOMAS then produced and caused to be produced Certified Metallurgical Test Reports reporting the falsified numbers from the B&L database to the prime contractor, knowing that the prime contractor would rely on those results when certifying to the Navy that the casting met the Specifications.

15. In cases where a heat failed one or more tests, THOMAS sometimes ordered that the castings and test blocks be reheat treated in an effort to remedy the characteristics of the steel such that the steel would pass the tests following the reheat treatment. However, in some cases, the heat would again fail certain tests after the reheat. In those cases, THOMAS sometimes produced, and caused to be produced,



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Certified Metallurgical Test Reports that impermissibly combined the passing portions from the original heat treatment with passing portions from a reheat treatment to make it appear that all passing results came from testing conducted after a reheat treatment. THOMAS also produced, and caused to be produced, Certified Metallurgical Tests using informal tests known as "pretests." The Certified Metallurgical Test Reports created the appearance that these results were the results of tests conducted after the final heat treatment.

16. Between 1985 and 2017, THOMAS falsified one or more test results for at least 240 heats of high-yield steel provided to the United States Navy for installation in submarines, including heats that produced critical hull components. These 240 heats represented approximately 50% of all of the known high-yield steel that the Tacoma Foundry produced for installation on submarines over this period.

**2. THOMAS's False Statements to Bradken and to Federal Agents**

17. On May 22, 2017, a Bradken metallurgist discovered evidence that THOMAS had falsified Charpy V-notch test results for one heat (heat number 433415). When members of Bradken management confronted THOMAS, THOMAS admitted to falsifying the test results for heat 433415, and made statements suggesting that THOMAS had also falsified other test results.

18. However, on June 1, 2017, Bradken conducted a further interview of THOMAS. During the interview, THOMAS recanted her prior admissions, denied improperly altering the test data for heat 433415, and falsely stated that there must have been a legitimate explanation for the discrepancies between the databases and for the alterations on the test cards. THOMAS made these statements despite knowing that the data discrepancies and alterations were the result of her own deliberate fraud, and knowing further that THOMAS had also falsified hundreds of other test results.

19. THOMAS participated in voluntary interviews with special agents from the Defense Criminal Investigative Service ("DCIS") and the Naval Criminal Investigative Service ("NCIS") on June 7, 2017, June 20, 2017, November 19, 2019, and December



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20, 2019. During those interviews, THOMAS made false statements with the intent to conceal from the United States the fact that THOMAS had submitted hundreds of fraudulent certifications to the prime contractor. For example, on June 7, 2017, THOMAS stated that she believed she had not purposely changed test results relating to heat 433415. On November 19, 2019, THOMAS acknowledged that she had changed the Charpy V-notch results for heat 433415, but stated that she must have had a good reason to change the results.

**D. Execution of the Scheme to Defraud**

20. As one example of an execution of the scheme to defraud, on or about March 18, 2016, at Tacoma, within the Western District of Washington, THOMAS provided and caused to be provided to the prime contractor a Certified Metallurgical Test Report for heat number 412715. THOMAS falsely represented on the Certified Metallurgical Test Report that the -100°F Charpy V-notch tests had returned passing values of 58, 51 and 59 foot-pounds, when in fact, the true test results were failing values of 48, 41, and 49 foot-pounds.

All in violation of Title 18, United States Code, Section 1031.

And the complainant states that this Complaint is based on the following information:

I, Special Agent Jodi Crawford of the Defense Criminal Investigative Service ("DCIS"), depose and say under oath:

**AFFIANT BACKGROUND AND SCOPE OF AFFIDAVIT**

1. I am a Special Agent with the Department of Defense Office of Inspector General, Defense Criminal Investigative Service (DCIS) and have been so employed since July 2012. I received a bachelor's degree in Child and Family Services in 1998 from Iowa State University and a Juris Doctorate in 2001 from Drake Law School. From 2001 through 2006, I was a Naval Officer in the United States Navy Judge Advocate General's Corps where I both defended and prosecuted sailors, Marines and Coast Guardsmen in military courts-martial in a variety of cases. From 2006 through 2009, I



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served as an Assistant Attorney General (AAG) with the Washington State Attorney General's Office, where my duties involved the civil commitment of high-risk sexual offenders to Washington's Special Commitment Center (SCC) on McNeil Island. From 2009 through 2012, I was employed as a Special Agent with the Naval Criminal Investigative Service (NCIS). I started my career with NCIS in the general crimes unit and eventually was assigned to the NCIS Fraud Squad in December of 2010, where my duties included investigating major procurement fraud, corruption, and bribery within the Department of the Navy.

2. In my current position as a Special Agent with DCIS, I am responsible for investigating criminal and civil violations, including major procurement fraud, bribery, healthcare fraud, and corruption against Department of Defense programs and operations. During my tenure as both an NCIS and DCIS agent, I have received training and participated in numerous federal fraud, bribery and corruption investigations. I have participated in the execution of federal search warrants and arrest warrants in these types of investigations, and I have training in federal procurement fraud schemes and investigative techniques. I attended the Criminal Investigator Training Program (CITP), the NCIS Special Agent Basic Training Program as well as the DCIS Special Agent Basic Training Program at the Federal Law Enforcement Training Center (FLETC) in Brunswick, GA. I also receive mandated Special Agent refresher training at FLETC. I have attended other specialized training courses, including the Economic Crimes Investigation and Analysis course, the Public Corruption Investigations Training Program and others.

3. I am submitting this Affidavit in support of the foregoing Complaint against defendant ELAINE THOMAS. I know the information in this Affidavit based on my training and experience; interviews I have conducted; documents I have reviewed; and other information I have learned in the course of this investigation. Because the purpose of this Affidavit is to establish probable cause for the charge asserted in the Complaint, this Affidavit does not include all the information I have learned relevant to



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this investigation. Rather, the information in this Affidavit is limited to that relevant to the question of whether probable cause exists to support the charge asserted above.

## SUMMARY OF PROBABLE CAUSE

### A. Bradken's Provision of Steel for Naval Submarines

4. During my eleven years as a Special Agent, and in the course of this investigation, I have developed knowledge about the use of high-yield steel on naval submarines, as well as Bradken, Inc.'s role in producing that steel. The sources of my knowledge include, but are not limited to: (a) review of Tech Pub 300 and Military Specification 23008 (the documents that set specifications for high-yield steel); (b) interviews of managers and other employees of Bradken, including multiple interviews of THOMAS, Bradken's current metallurgist, and other lab personnel; (c) interviews of managers and other employees of the prime contractors that purchase steel castings from Bradken and install them in naval submarines; (d) multiple site visits to Bradken's Tacoma foundry; (e) review of thousands of pages of Bradken's internal records; (f) interviews of a steel expert retained by Bradken to provide information in connection with this investigation; and (g) extensive consultation with technical experts at Naval Sea Systems Command (NAVSEA) in Washington D.C.

5. Based on these sources, I know that Bradken has operated a specialty steel foundry in Tacoma, Washington (the "Tacoma Foundry") since about July 2008. Before being acquired by Bradken, the foundry was owned and operated by Americast (during 2007 and part of 2008) and Atlas Castings and Technology (from the foundry's inception until 2007).

6. The Tacoma Foundry has produced high-yield steel castings for the United States Navy since about 1984. High-yield steel is a specialty product that meets stringent specifications reflecting its strength, toughness, and other characteristics. The Navy requires that certain critical submarine components be composed of high-yield steel. The Tacoma Foundry produces two types of high-yield steel relevant to this investigation,



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which are known as "HY-80" and "HY-100." The Tacoma Foundry is the only foundry in the United States capable of producing HY-80 and HY-100 castings over a certain thickness.

7. Naval submarines are fabricated by two contractors: Electric Boat Company (a component of General Dynamics) and Newport News Shipbuilding (a component of Huntington Ingalls Industries). Electric Boat, as the prime contractor, contracts directly with the Navy to produce submarines in accordance with Navy specifications. Electric Boat and Newport News Shipbuilding each build certain parts of the submarines under a Teaming Agreement and then integrate those parts to deliver a submarine to the Navy. Each of those contracts substantially exceeds $1 million in value. The contractors, in turn, contract with Bradken to produce HY-80 and HY-100 steel components for each submarine.

**B. Specifications for High Yield Steel**

8. ***High Yield Steel Production:*** High yield steel is used for critical submarine components. If the steel fails, catastrophic damage and possible loss of lives would result. The numbers in the names, HY-80 and HY-100, refer to the yield strength in force per square inch. As such, HY-80 steel is designed to withstand up to 80,000 pounds of force per square inch (psi), and HY-100 steel is designed to withstand up to 100,000 psi.

9. The metal castings produced by the Tacoma Foundry start as a batch of molten metal called a "heat." The Tacoma Foundry melts and combines various elements to produce steel with the necessary characteristics. After melting, the molten metal, or heat, is poured into a sand mold, or shape, to cool. At this point, the chemical properties of the casting are set and cannot be changed. Once cooled, the casting is removed from the sand mold and heat treated (placed into a furnace for a designated time and at a designated temperature) to give it certain mechanical properties. Once it comes out of the furnace, it is quenched or cooled rapidly. Some important mechanical properties of



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steel include its ductility, hardness, toughness, and strength. Heat treating a casting can change these mechanical properties to make the steel perform in a certain way.

10. ***High Yield Steel Specifications and Testing:*** After the Tacoma Foundry heat treats a casting, the steel is tested to determine its mechanical properties. The actual casting, however, is not tested, both because it can be impractical to test a casting, and because the test could damage the casting. Instead, a test block, which must be as thick as the thickest section of the casting, is poured from the same heat and continues with the casting through the same heat treatment processes. This test block, which is designed to represent the casting in its chemical and mechanical properties, is cut up and tested.

11. The Navy requires that each heat of HY-80 and HY-100 steel used to form a casting meet certain specifications. These specifications are currently set forth in a publication known as "Tech Pub 300," and were previously contained in a publication known as "Military Specification 23008." In this Affidavit, I will refer to the Tech Pub 300 and Military Specification 23008 together as "the Specifications."

12. The Navy requires steel producers such as the Tacoma Foundry to perform a variety of tests on castings, and to certify that the castings meet the Specifications. These tests include chemical, mechanical and visual testing. Four mechanical tests are performed on the casting's test block: (1) the tensile test; (2) the Charpy V-notch test at 0 degrees Fahrenheit; (3) the Charpy V-notch test at -100 degrees Fahrenheit; and (4) the dynamic tear test. During the period relevant to my investigation, the Tacoma Foundry's metallurgical lab performed the tensile test and the Charpy V-notch tests, while an outside company performed the dynamic tear test.

13. The tensile test determines the steel's strength. Steel installed on critical portions of the submarine must be strong enough to withstand harsh marine environments. The tensile test is performed on a specimen cut out of the test block that is machined into a long bar that is more narrow in the middle. The tensile bar is often referred to as a "dog bone" because of this shape. The tensile bar is then placed into the tensile machine, which pulls on the ends of the tensile bar at increasing force until the bar



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yields and then breaks. The tensile machine plots on a graph the forces that caused the tensile bar to stretch and eventually break. An employee of the metallurgical laboratory can then determine the ultimate tensile strength and yield strength of the steel. A specimen that tests at 80 to 99.5 ksi meets the requirements for HY-80 steel, and a specimen that tests at 100 to 120 ksi meets the requirements for HY-100 steel.

14. The Charpy V-notch test tests the toughness of the steel. Cracks in brittle steel are unstable and fail quickly, sometimes prior to detection. When a crack occurs in a casting, ideally the casting should absorb much of the energy plastically so the crack grows slowly. This allows time to detect the crack and fix it before the casting completely fails. This feature is especially important during war time or collisions, because it allows a damaged vessel to continue operations until it can get to port for repair.

15. The Charpy V-notch machine measures the amount of energy a sample absorbs during an impact. The Charpy V-notch test specimen cut from the test block resembles a rectangle with a V-shaped notch cut into the sample at the midpoint. The test sample is cooled in a liquid nitrogen bath to the specified temperature (either 0 degrees or -100 degrees Fahrenheit). The cooled sample is then inserted into the Charpy V-notch machine, where a hammer attached to the end of a heavy pendulum is released to collide with, and break, the test specimen. The test machine measures the distance that the pendulum continues following the impact with the specimen. That distance is a measure of the amount of energy the specimen absorbed, that is, its toughness.

16. The Specifications require that the Charpy V-notch test be repeated three times at each temperature (0 degrees and -100 degrees Fahrenheit). The three results at each temperature are averaged. A test specimen for both HY-80 and HY-100 cooled to -100 degrees Fahrenheit must test at a minimum of 45 foot-pounds for each individual test, with an average of the three tests no lower than 50 foot-pounds. Test specimens for both HY-80 and HY-100 cooled to 0 degrees Fahrenheit must test at a minimum of 65



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foot-pounds for each individual test, with an average of the three test results no lower than 70 foot-pounds.

17. ***Reporting and Certification of Test Results:*** The Tacoma Foundry is required to report all test results (whether chemical, mechanical or visual, and whether performed by Bradken or an outside company), to the customer in a signed and sworn certification package. The certification package, which is delivered with the casting, contains dimensional inspections, any approved deviations from the requirements, welding records, and the Certified Metallurgical Test Report (CMTR), among other documents.

18. The Tacoma Foundry's metallurgical lab is responsible for the CMTR portion of the certification package, which documents the casting's chemistry, heat treatment history and results of the mechanical testing. The CMTR is signed by a lab employee under a paragraph which notes the contents of the CMTR are "correct, accurate, and that all test results and operations performed are in compliance with the requirements of the material specification and the applicable material requirements." The Navy requires these certifications to ensure that the required testing was completed; that the casting meets the Specifications; that the casting will perform as intended; and that there is a record of the exact qualities of the casting. If the Navy does not receive accurate information in casting certifications, specifically the CMTR, the overall engineering of the vessel could be flawed and could lead to failures. The Navy also relies upon these certifications when it issues payments to the prime contractors.

## C. Bradken's Metallurgy Lab

19. ***Role of ELAINE THOMAS:*** I know based on my training and experience that each foundry typically employs one or more metallurgists. Metallurgists are responsible for researching and developing methods for melting, alloying (combining two or more metal elements to form a specific material) and pouring to produce quality castings.



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20. I have learned in this investigation that ELAINE THOMAS was employed as a metallurgist at the Tacoma Foundry from about 1977 until May 23, 2017. As discussed in more detail below, I have interviewed THOMAS on four occasions, and have also interviewed numerous witnesses about their observations of THOMAS. In describing her job, THOMAS has compared herself to a cook that developed recipes and cooking methods for the steel produced at the Tacoma Foundry.

21. THOMAS, as the Tacoma Foundry's metallurgist, conducted and oversaw the lab's testing of high yield steel. In cases when the Tacoma Foundry received a novel request from a customer, THOMAS advised the company as to whether or not the foundry was capable of producing the requested steel, and whether the company would financially benefit from the sale. In short, THOMAS was the scientist on site at Bradken, overseeing the chemical and physical properties of the steel and the processes used to produce it. As part of these responsibilities, THOMAS was responsible for ensuring the accuracy of the CMTRs provided to the prime contractors.

22. ***The Tacoma Foundry's Recordkeeping Practices:*** I have interviewed THOMAS and other members of the Tacoma metallurgy lab about the recordkeeping practices the foundry employed during the period before May 23, 2017. I have also reviewed the test cards and databases the lab used to record test results. I learned that, for the three mechanical tests performed in-house (the tensile test and the two Charpy V-notch tests), lab employees initially recorded the test results by hand on 3x5-inch index cards (hereinafter "test cards"). The test cards were labeled at the top with the heat number, the customer, the casting's serial number(s), the type of metal (e.g., "864" for HY-80 and "865" for HY-100), and the applicable specification and the test to be performed. The person performing the test typically recorded the results on the test card. In the case of Charpy tests, an employee with the initials "G.G.," operated the machine between 1966 and November 2016. In November 2016, G.G. retired. An employee with the initials B.M. has operated the machine since November 2016. I understand from my own observations of the machine, as well as statements made by THOMAS, that



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THOMAS was not able to conduct Charpy tests herself because she could not lift the machine's heavy pendulum.

23. After recording the initial test results on the test card, lab personnel entered the result in various databases and spreadsheets, depending on the time period. Prior to 2008, raw test results were entered into a custom IBM database called AS400. The AS400 was capable of performing required calculations on the raw testing results and then automatically populating the certifications provided to the customer. The AS400 was searchable based upon certain criteria. Lab employees used the AS400 searching function to look up historical information for quoting purposes and other essential foundry functions.

24. In 2008, after being acquired by Bradken, the lab adopted a new software program called "B&L," which was already in use at other Bradken facilities. From 2008 forward, the lab used the numbers in the B&L system to populate the CMTRs sent to the prime contractors.

25. Although similar to AS400, B&L lacked some of AS400's functionality. For example, B&L did not perform the required calculations on raw testing data, nor was it searchable by certain criteria. While the B&L system was more beneficial to other departments at Bradken (because it was used company-wide), THOMAS believed B&L was a step backward in functionality. As a result, THOMAS and other lab employees continued to use the AS400 to perform required calculations and to store test data for research purposes. The test data was not always entered into the AS400, however, because it was not a requirement for producing a casting. Because the B&L system generated the final certifications to be delivered to the customer along with the steel, the lab employees were always required to input data into B&L.

26. At some point, lab employees also started to utilize an excel spreadsheet they called the "tensile spreadsheet." All the raw test results, calculations, third party testing results and other critical information was entered into this spreadsheet. Presumably, this spreadsheet was created and maintained to keep all testing information



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for a heat in one location. By the time the tensile spreadsheet was put into use, Bradken's lab was utilizing four different recordkeeping systems (test cards, AS400, B&L and the tensile spreadsheet) to record the same test results. There was no standard procedure in place for entering the testing data into these four data sets, except that the original raw test scores were written by hand on the test cards, and the B&L data was always used for the CMTRs (certifications). THOMAS and other employees told me that, after the test cards were completed, the cards would often be left in various places in the lab until someone entered the data into the tensile spreadsheet, possibly the AS400, and ultimately the B&L.

27. With regards to the Charpy V-notch testing, there was no mechanical record made of the testing results. After it was released, the Charpy V-notch machine pendulum would break the specimen and the dial would record the energy in foot-pounds. Once the lab employee recorded the result from the dial onto the test card and reset the dial for the next test, there was no other record of the original test result other than the score written down on the test card.

28. By contrast, the tensile machine did create a real-time record of the testing results. Prior to starting the tensile machine, the lab employee would attach sensors to the tensile bar. During the test, the sensors cause the creation of a graph showing the force applied and the elongation observed in the material during the test. Bradken maintains these tensile graphs, which can be referred to after a test to verify the correct test results were written on a test card or entered into a certification.

29. In September of 2013, Bradken hired a new metallurgy intern with the initials "E.P." After two months, Bradken hired E.P. as a full-time metallurgist. Bradken's goal in hiring E.P. was to prepare her to take over all metallurgist duties from THOMAS, who was planning to retire from Bradken after forty years. In January of 2017, Bradken promoted E.P. to Metallurgy Manager, and THOMAS started to work part time, a few days a week, until the time of her retirement, which had not yet been set.



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**D. Interviews of Bradken Management**

30. ***Bradken's Discovery of the Fraud:*** I have conducted numerous interviews of E.P., several of which have addressed the events of May 22, 2017, which are described below. I have also reviewed a written account that E.P. prepared on or about May 22, 2017 memorializing the events of that day.

31. E.P. related that, on May 22, 2017, E.P. reviewed Bradken test data relating to heat number 433415 to respond to questions Electric Boat had posed in connection with an audit. E.P. noticed a discrepancy, or difference, between the percent sheer reported in Bradken's databases.[1] Specifically, the results recorded in the B&L reflected a passing percent sheer of 50% while the tensile spreadsheet contained a failing percent shear value of 30%. Upon further review of this same heat in the databases, E.P. discovered the -100°F Charpy V-notch results recorded in the B&L database reflected passing test results of 53, 47, and 56 foot-pounds. However, the same test results recorded in the tensile spreadsheet were non-passing values exactly 20 foot-pounds lower for each test, that is, 33, 27, and 36 foot-pounds, respectively. E.P. then reviewed the AS400 database and found this database contained the same non-passing results as the tensile spreadsheet.

32. E.P. suspected the discrepancy was the result of fraud. E.P reported the discovery to a member of Bradken management with the initials "B.F.," whom I have also interviewed. E.P. and B.F. report that, at the same time E.P. was describing her findings to B.F., E.P. inspected the original test card. E.P. noticed that it appeared that the non-passing results had been written in pencil on the card, but that someone had overwritten those numbers, using pen. The second set of numbers corresponded to the passing numbers in the B&L database. I have reviewed this test card and confirmed

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[1] If the specimen surface at the break appears flat, the metal is brittle. If the specimen surface at the break appears jagged, the metal is ductile. Because a fracture surface usually does not break in one way, the individual examining the fracture surface will assign a percentage of ductile surface versus flat surface. This is called the percent sheer.



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E.P.'s observations. That is, it appears that the card was altered to change the results from failing to passing.

33. ***THOMAS's May 23, 2017 Statements:*** B.F. reported E.P.'s findings to another Bradken manager, whom I have also interviewed, with the initials "S.G." I have also reviewed contemporaneous notes that B.F. and S.G. made on or about May 23, 2017. B.F. and S.G. both reported that, on May 23, 2017, they met with THOMAS to question her about the data discrepancies. Both B.F. and S.G. recounted that THOMAS told them she remembered heat 433415, and admitted she had changed the -100°F Charpy V-notch test results from failing results to passing results so that the heat would meet the specification. THOMAS told B.F. and S.G. that she had modified the results because the other test results for the heat were very good, so she believed the quality of the steel was sufficient.

34. Both B.F. and S.G. also recounted that THOMAS made statements during the May 23 meeting suggesting that THOMAS had also falsified other test results in addition to heat 433415. S.G. recalled that he asked THOMAS whether this had occurred before, to which THOMAS responded "hardly ever." B.F. recalled THOMAS stating "I might have fat fingered" other results, and offered to assist Bradken in identifying them. Both S.G. and B.F. reported that THOMAS stated she kept the "true" test results in the AS400 database.

35. ***Discovery of "Cherry Picked" Certifications:*** S.G. and B.F told me that Bradken reported its discovery of the falsified test results to Electric Boat and Newport News Shipbuilding. At the time, Electric Boat was preparing to certify a new Navy submarine. Electric Boat asked Bradken to immediately review testing data for the Bradken-produced castings for that submarine to determine whether any discrepancies existed in the test data. Bradken tasked E.P. with conducting this review.

36. I have interviewed E.P. about her research, and have also reviewed some of the documents she reviewed. E.P. reported, and the records show, that three of the heats for the submarine at issue had initially failed one or more tests. The records further



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indicated that, following these failing tests, THOMAS had ordered these heats (the "Cherry Picked Heats") to be reheat treated.

37. In a reheat treatment, a casting is placed back in the furnace, which changes its mechanical properties. Foundries sometimes reheat treat castings after they initially fail one of the tests. Because the reheat treatment changes the steel's mechanical properties, a heat that failed a test prior to the reheat treatment may pass the same test after the reheat. If the casting passes a test after the reheat treatment, the foundry may report the new, passing value on its certification. However, the foundry cannot report the results of any test conducted prior to the reheat treatment. This is because the reheat treatment changes the steel's characteristics, so any test results obtained before the reheat treatment no longer reflect the steel's characteristics.

38. Bradken's records showed that, following the reheat treatment, the Cherry Picked Heats were retested, and again failed some of the tests. However, E.P. found that THOMAS had nonetheless certified these castings by combining some passing results from tests conducted before the reheat treatment with other passing results from tests conducted after the reheat treatment. By combining these results, THOMAS had impermissibly created a single set of results that together appeared to meet the Specifications. Furthermore, in two of those cases, THOMAS had reported results from an informal procedure called a "pretest." Pretest results are intended to be used for internal planning purposes only, and may never be reported on a certification.

39. ***June 1, 2017 Interview of Elaine THOMAS:*** One June 1, 2017, S.G. and another Bradken employee with the initials "A.A.," along with two outside attorneys representing Bradken, participated in a further interview of THOMAS. I have interviewed both S.G. and A.A. about this event, and have also reviewed a memorandum prepared by Bradken's counsel summarizing THOMAS's statements.

40. S.G, A.A., and the memorandum of counsel all reported that, during the June 1 interview, THOMAS recanted the admissions she had previously made on May 23. THOMAS stated that, after giving further thought to the issue, she believed she



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would never have intentionally falsified test data. THOMAS stated that there must have been "a legitimate reason" for the discrepancy in Bradken's data for heat 433415. THOMAS stated that, contrary to her statements on May 23, she could not remember heat 433415.

41. THOMAS suggested to the interviewers that the data discrepancies could be explained in either of two ways. First, she said that there might have been a flaw in the original test procedure. If that had occurred, THOMAS said, THOMAS might have performed a retest (which is permissible under some circumstances) and failed to document the retest. THOMAS hypothesized that the data in the AS400 database might reflect the test results of the original test, while the data in the B&L database reflected the test results from after the retest. Alternatively, THOMAS suggested, perhaps the original test card had been grouped with the wrong specimen, resulting in the test results being initially misreported in the AS400 database and then corrected in the B&L database. However, the interviewers pointed out to THOMAS that, under these scenarios, it was highly unlikely that each of the three test results would have changed by exactly 20 foot-pounds each, from a failing value to a passing value. THOMAS responded that "that is odd," and was unable to explain why the numbers would change by exactly 20 foot-pounds. THOMAS acknowledged that the alterations on the test card were her handwriting, which would be unlikely if someone else conducted the retest. As discussed above, THOMAS could not have conducted a retest herself because of the weight of the pendulum.

42. The Bradken questioners also questioned THOMAS about the apparent use of pretest and pre-reheat test results in the certifications for the Cherry Picked Castings. THOMAS was unable to provide an explanation.

**E. Review of Bradken Internal Records**

43. ***Discovery of Pattern Heats through Data Analysis:*** After the initial discovery by Erin Patterson of altered test data, Bradken issued a Letter of Advisement



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(LOA) to the contractors, and the LOA was then provided to the Navy. An LOA alerts the customer to a problem with a casting that has already shipped. As noted above, one significant feature of this initial discovery was that all three Charpy V-notch test results were increased by exactly twenty foot-pounds from failing scores to passing scores, a highly unlikely result from a retest of additional samples from the casting's test block. This kind of pattern (an increase by ten or twenty foot-pounds of all three individual tests from failing to passing), is indicative of intentional fraud rather than human error in recording the test results.

44. Bradken conducted an internal investigation to identify other discrepancies within its databases. When it discovered discrepancies, Bradken produced additional LOAs identifying the questioned castings. However, Bradken's LOAs only reported the most conservative, or lowest, test results found in all the data sets for a heat to assist engineers in making safety determinations based upon worst-case test results. The LOAs did not disclose to the Navy whether the discrepancies followed any patterns that might be indicative of fraud.

45. Because Bradken was already in the process of a routine requalification to provide HY-80 and HY-100 castings for submarine construction, the Navy was in possession of the last five years of testing data from Bradken, a required requalification submission. After the initial discovery of the discrepant data, Bradken submitted additional testing information obtained from its internal investigation to update its requalification request. A Naval Sea Systems Command (NAVSEA) Materials Engineer began analyzing Bradken testing data for patterns indicative of fraud.

46. I have had numerous discussions with this engineer about her findings and have reviewed summary materials that describe them. Specifically, the NAVSEA Materials Engineer noticed that, when Bradken's database contained conflicting test results, the discrepancies followed a pattern. The engineer noticed that, in cases where the databases contained two different sets of results for one test, it was common for the digit on the "ones" location to be the same between the two results, while the digit in the



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"tens" location to be changed to achieve a passing score. For example, the recorded result for a Charpy V-notch test in the AS400 database might be 44 foot-pounds (a failing result), while the result recorded in B&L for the same test might be 54 foot-pounds (a passing result). This change in only the ten-digit location of a test result is highly unlikely to be the result of a retest or human error, and instead, is indicative of fraud. As discussed above, this pattern was also present in the initial data discrepancy discovered by E.P. Investigators in this investigation refer to heats following this pattern (an increase of exactly 10 or 20 foot-pounds from failing to passing) as "pattern heats."

47. ***Review of Test Cards:*** After discovering the prevalence of pattern heats, the government requested Bradken's original test cards to conduct an independent review. As Bradken started to produce original HY-80 and HY-100 test cards in batches, the NAVSEA Materials Engineer, along with myself, reviewed the test cards for indications of erasure marks and test results changing in patterns from failing to passing. Erasures marks on the test cards were frequently noted under only the ten-digit location of test results. In some cases, the erased number could still be read, and in many cases, all three Charpy V-notch test results were increased exactly by ten or twenty foot-pounds (*i.e.*, these qualified as pattern heats).

48. Another pattern I observed involved the tensile test. In numerous instances, on HY-80 test cards reporting tensile yield strength, I observed that the number in the tens position would be a 7 that was modified to appear as an 8, or the 7 was erased and overwritten with an 8 to change a failing yield strength result to a passing yield strength result. For example, the result recorded on the card might change from a 71 to an 81. Review of early batches of original test cards produced by Bradken indicated the intentional changing of test results was persistent and spanned a significant period of time.

49. Based on these findings, the government took custody of all test cards Bradken maintained on site, including HY steel and non-HY alloys, going back to the 1980s. The NAVSEA Materials Engineer and I conducted a comprehensive review of all



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HY-80 and HY-100 test cards. The review of all HY-80 and HY-100 test cards obtained from Bradken revealed 240 heats with indications of fraudulent alterations. These 240 fraudulently-altered heats include nearly 50% of all known high-yield steel produced by Bradken for installation on submarines. Furthermore, 97 of those 240 heats are considered "pattern heats." We shared our findings with E.P., Bradken's metallurgist. E.P. concurred with out conclusions of fraudulent changes and the existence of pattern heats. E.P. also reviewed all tensile graphs associated with those heats that contained erasure marks or suspicious changes to the test card. E.P.'s review of tensile graphs confirmed that many of the erasures were indeed fraudulent. In a minority of cases, the tensile graphs actually indicated that an erasure was not fraudulent. Those instances are not included in the 240 fraudulent heats discussed above.

**F. Government Interviews of THOMAS**

50. ***2017 Interviews:*** I first interviewed THOMAS at her residence on June 7, 2017. During this interview, THOMAS explained the various databases and test cards used at Bradken to record test results, perform calculations and generate certifications to the customers. THOMAS stated that, prior to her termination, she had requested that Bradken provide a database that could perform the necessary functions for the lab, but that Bradken had failed to acquire such a database.

51. When asked about the data test discrepancy discovered by E.P., THOMAS acknowledged that the alterations (the pen-written passing results) on the test card were in her handwriting. THOMAS could not recall exactly what the discrepancies were, but recalled it had something to do with the percent of fibrous fracture of the material tested. When asked if she altered the percentage when it was entered into the database, THOMAS responded she "didn't think" she had purposely changed it. She also stated she did not have a motive to alter the results. She speculated the test cards were mixed up or misplaced, which she said could explain the discrepancy. In a second interview on



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June 20, 2017, THOMAS again voluntarily described Bradken's processes and record keeping to myself and a NAVSEA engineer.

52. ***November 19, 2019 Interview:*** On November 19, 2019, THOMAS voluntarily came to federal offices to speak with NCIS and DCIS agents. THOMAS again admitted that the passing test results written over the failing test results were her handwriting. This time, however, THOMAS stated she must have raised the test results because she believed a lab employee had misread the dial on the Charpy V-notch machine. THOMAS conceded, however, that she would have had to have guessed when she raised the numbers because she was not in the room to read the dial during Charpy V-notch testing. THOMAS stated, "I did it; it's my handwriting. I left and to this day, I don't know how it happened."

53. During the November 19, 2019 interview, I showed THOMAS numerous examples of altered test cards. For example, I asked THOMAS to review the Charpy V-notch test card for a heat tested in 2016. During the review, she noted all three test results appeared to be erased in the ten-digit location and altered upward by ten foot-pounds. THOMAS agreed the increase in the -100°F Charpy V-notch numbers for this heat and the original heat discovered by E.P. did not occur as the result of a retest. After examination of test cards for a 2009 heat, THOMAS noted two of the three Charpy V-notch test results were changed from "37" and "31" to "57" and "51" when someone added a horizontal line at the top of the "3" in both ten-digit locations. Similarly, after reviewing the tensile test card for a 1990 heat, THOMAS said a swirl had been added to the 7, making it an 8. She confirmed this change, 74.9 ksi to 84.9 ksi, by performing some calculations on her personal phone. THOMAS could not explain what had happened, but stated that "it stinks," and further, the casting never should have been shipped from Bradken with a failing yield strength of 74.9 ksi. THOMAS insisted she would have sent this casting back for a reheat treatment to strengthen the steel before certifying it.



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54. During the November 19, 2019 interview, THOMAS criticized the -100°F Charpy V-notch test. THOMAS said -100°F was a "stupid number" to test because nothing operated at -100°F in the water. She also admitted, however, she did not know the Navy's reasoning for testing at this temperature. THOMAS acknowledged that someone at Bradken had been changing failing -100°F Charpy V-notch testing results to passing. THOMAS also admitted that she could have been the one to raise the numbers because she believed the -100°F Charpy V-notch testing was "a stupid requirement." When asked why she raised the yield strength numbers for the 1990 heat, THOMAS stated, "It looks like I raised the numbers to make it pass. This was not the right thing." THOMAS said occasionally she would consider rounding up -100°F Charpy V-notch results if the numbers were "super duper" close to passing.

55. ***December 20, 2019 Interview:*** I conducted a fourth interview of THOMAS on December 20, 2019. Again, THOMAS voluntarily met with me and an NCIS agent at federal offices. During this interview, THOMAS said she had lied on May 23, 2017 when she told Bradken managers that she had altered testing data. According to THOMAS, she lied because the Bradken managers were "willing to believe" THOMAS changed the numbers. THOMAS said that she had admitted to altering the numbers out of anger with her colleagues. She decided that day to "stick it to them."

56. THOMAS reiterated a statement from her prior interview, explaining if the -100°F Charpy V-notch test result was "super-duper" close to passing and the other tests looked satisfactory, she would bump up the test results to passing. I then had the following exchange with THOMAS:

Myself: But Elaine, you're signing certifications --

THOMAS: That's right.

Myself: -- saying that this test is 50. Not 47. Fifty.

THOMAS: Fifty. That's right.

Myself: Is that a lie?



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THOMAS: It sounds like it when you say it, but it felt pretty good when I said I did it. I felt comfortable with it. Yeah. I felt comfortable with it.

Myself: You felt comfortable changing the foot-pounds.

THOMAS: Yeah, I did. If it was one or two, I felt okay about that. Yeah, I felt okay about that.

Myself: And I think you felt okay when everything else looked

good, like the tensile and the zero degree and the DT. I think you felt good on this heat, 433415, adding 20 foot-pounds. Because you felt the casting was good. And that's why you said it that day [at Bradken].

THOMAS: It's not beyond the realm of possibility, but I really don't know that I did that.

57. THOMAS then reviewed a test card from 2016 and agreed she bumped up the three Charpy V-notch testing results by ten foot-pounds each, using what she termed "engineering judgement" to justify the increase. THOMAS stated, "Yeah, that looks bad."

58. THOMAS also reviewed test cards involving a casting that was poured in 1990 and tested in 1991. After reviewing the original test card, THOMAS explained the three -100°F Charpy V-notch test results all appeared to be erased and increased by exactly ten foot-pounds. She also noted the increased test results were in her handwriting. The following exchange then took place:

Myself: And the chances of the 34, 34 and 35 all going -- here, I'll give you the card -- all going up by 20 foot-pounds is highly unlikely, especially for a third time now.

THOMAS: Yeah, I don't like that.

Myself: You don't like it because it's altered?

THOMAS: I don't like the, I don't like the looks that it's altered. No.

Myself: Okay. Who altered it?

THOMAS: And it looks like my writing. It does look like my writing.

Myself: Were you doing this back in 1990, Elaine?

THOMAS: I don't know, obviously.

Myself: It looks like you were.



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THOMAS: This is in '91.

Myself: Oh, I'm sorry. The heat --

THOMAS: Yeah, is --

Myself: -- is a '90 pour, right?

THOMAS: Yeah, yeah, yeah.

Myself: And who did the test?

THOMAS: Jerry. Jerry did the test.

Myself: Jerry. So our reliable guy is in the lab.

THOMAS: Yeah. He's doing it right. But I -- yeah, I don't -- I think it looks, I think it looks phony. That looks phony to me.

Myself: And it's your handwriting.

THOMAS: It is.

After discussing this 1990 heat more, THOMAS stated, "Boy, I don't remember doing this this much," and "I did a couple of foot-pounds, but boy, I wouldn't have guessed 50 and 20."

59. After reviewing a test card from 2016, THOMAS admitted one of the -100°F Charpy V-notch foot-pounds results was raised by twenty foot-pounds. She also described the changes as "fishy." The following exchange then took place:

THOMAS: Two [foot-pounds], I can get away with it. Twenty [foot points], I don't feel good about that. No, I don't feel good about that.

Myself: Don't feel good about it, but-

THOMAS: No.

Myself: —it still happened.

THOMAS: It happened.

60. Throughout her December 2019 interview, THOMAS stated she thought she had better "boundaries" than she observed after reviewing alterations on test cards. She expressed difficulty in admitting to changing numbers because of her high reputation in the community. For example, THOMAS said, "I'm totally willing to take the



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responsibility, because obviously my hands all over this thing. And even though I thought I was doing the right thing and using my good judgement, I -- you know, you've got things that show poor judgement. And even though I'm not sure -- I don't recall doing this, okay? And I don't, I don't feel like there was any kind of concerted effort to do this on a routine basis or anything. I mean, I think it was one by one. I tried to look at each case as they came by." THOMAS later stated, "Well, I think the really important thing here was that I tried to look at things on a case-by-case basis. There's not some big concerted effort to pull something off, you know?"

61. "Engineering judgment," or determining a particular test result could be simply increased because other tests are satisfactory, is not allowed under any of the Navy specifications governing these castings or the industry standard. In her last interview, THOMAS agreed she could not use her "engineering judgment," which is her opinion, to change a failing test result to a passing result.

**G. Evidence of Fraud in Connection with Heat 412715**

62. The Complaint set forth above alleges that, on or about March 18, 2016, THOMAS provided and caused to be provided to the prime contractor a Certified Metallurgical Test Report (CMTR) for heat number 412715. I have reviewed records showing that Bradken produced a casting from this heat that was sold to a prime contractor for installation on a Navy submarine pursuant to a contract with a value substantially in excess of $1 million. I have reviewed this CMTR. The CMTR represents that the -100°F Charpy V-notch test results for heat 412715 are 58, 51 and 59 foot-pounds, which are passing values under the Specifications. I have reviewed the test data recorded for this heat in B&L, and that data matches the results reported on the CMTR. The CMTR is signed by THOMAS.

63. However, I have also reviewed the AS400 and the tensile spreadsheet for heat number 412715. My review of the AS400 shows two sets of test results for the -100°F Charpy V-notch test results: 58, 51 and 59 foot-pounds as well as 48, 41, and 49



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foot-pounds. My review of the tensile spreadsheet revealed the test results for heat number 412715 were 58, 51 and 59. Test cards no longer exist for heat number 412715.

JODI CRAWFORD
Complainant
Special Agent, DCIS

The above-named agent provided a sworn statement attesting to the truth of the contents of the foregoing affidavit by telephone on this 15th day of June, 2020. The Court hereby finds that there is probable cause to believe the Defendant committed the offense set forth in the Complaint.

HON. THERESA L. FRICKE
United States Magistrate Judge



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