Houston Forensic Science Center

Management Review 2020

To: Peter Stout, President/CEO

From: Erika Ziemak, Quality Director Erika Ziemak Digitally signed by Erika Ziemak Date: 2020.11.02 11:23:25 -06'00'

cc: Amy Castillo, COO
Jerry Pena, Director of the Crime Scene Unit and Forensic Multimedia
Cheron Maxwell, Forensic Biology Technical Leader Cheron Maxwell Digitally signed by Cheron Maxwell Date: 2020.11.09 15:46:18 -06'00'

Date: October 30, 2020

Re: Management Review 2020 (October 1, 2019 – September 30, 2020)

Contents

Purpose and Scope of the Management Review

The purpose of this review is to ensure the suitability and effectiveness of HFSC's quality management system and to assess potential opportunities for improvement of our current system. For the purposes of this review, *effective* refers to the degree to which HFSC's objectives are achieved and the extent to which problems are solved. *Management system* refers to the policies, procedures, and processes in place that allow us to meet objectives. The review was conducted by Quality Division staff members A. Harris, C. Hundl, C. Martinez, J. Moral, M. Neuman, M. Zamora-Pineda, and E. Ziemak.

Overview

HFSC is comprised of the following technical disciplines:

- Crime Scene Unit
- Forensic Multimedia (Digital Forensics and Audio/Video)
- Firearms
- Forensic Biology
- Latent Prints
- Seized Drugs
- Toxicology

As of this review, all disciplines are accredited by ANAB to the ISO/IEC 17025 standard. The Firearms, Forensic Biology, Seized Drugs and Toxicology sections are also accredited by the Texas Forensic Science Commission in accordance with Texas state law.

This management system review was conducted during October 2020, in accordance with Management review clause 8.9 from the Houston Forensic Science Center (HFSC) Quality Manual, ISO/IEC 17025:2017, and ANAB supplemental document. The Quality Division reviewed HFSC's management system and technical activities conducted between October 2019 and September 2020. The findings of the review are presented in this report.

The management system was found to be effective for the reasons stated throughout this report. However, recommendations for continuous improvement are listed in the Recommendations for Improvement section.

External & Internal Issues relevant to HFSC

External Issues

Coronavirus disease (COVID-19) Pandemic

On December 2019 in Wuhan China, a disease outbreak was reported to the World Health Organization (WHO). Upon further investigation, it was determined that the outbreak was caused by a novel/new coronavirus (COVID-19) and evidence suggested that the virus spread through human-to-human contact. On March 11, 2020, the WHO declared COVID-19 a pandemic. As part of the global effort to limit human-to-human transmission of COVID-19, HFSC encouraged staff to work remotely when possible, and for those who could not, to work alternate shifts. Other safety precautions included temperature checks, social distancing, removal of chairs from common areas and use of PPE. A team of HFSC volunteers sewed cloth masks for all employees and hand sanitizer was provided to all staff members. A "Keeping It Clean" initiative was also implemented which involved the use of pop culture-inspired signs hung throughout the administrative spaces reminding staff to socially distance, routinely wash their hands and wear proper PPE.

To mitigate COVID-19 transmission at work, HFSC implemented weekly testing of employees in July 2020 to actively detect and prevent this virus from spreading and disrupting operations.

While many technical sections were able to work remotely or work alternate shifts, the Crime Scene Unit (CSU) remained on its normal work schedule. Houston has experienced an increase in violent crimes since the pandemic, which has had a significant impact on CSU. Scene callouts between March and September 2020 increased by 25% compared to the same time period in 2019.

Texas Legislation Update

On June 10, 2019, the House Bill 1325 changed the statutory definition of marihuana in the Texas Health and Safety Code Chapter 481.002.26 to exclude hemp as defined by Agriculture Code 121.001. The Agriculture Code and HB 1325 define hemp as the plant Cannabis Sativa L. with a delta-9 tetrahydrocannabinol (delta-9-THC) of no more than 0.3%. This legislation change required laboratories to demonstrate suspected marihuana samples to not only contain delta-9-tetrahydrocannabinol (THC) but also have a concentration greater than 0.3% to distinguish marihuana from hemp. At the time of this passage, the Seized Drugs section was not capable of quantitating the concentration of delta-9-THC in plant substance material.

To be able to assist HFSC's stakeholders with this legislative change, the Seized Drugs section developed and validated a decision-point assay method for plant material on September 7, 2020. This analytical procedure not only identifies substance(s), but also determines whether the concentration of a substance, in this case delta-9-THC, is above or below a decision-point. Although legislation sets a 0.3% decision-point to distinguish marihuana from hemp, the "administrative decision-point" validated and used by HFSC is at 1% or above. The laboratory "administrative decision-point" threshold was extended from the legislative decision point to encompass the variability in the assay procedure and to mitigate the risk of potentially reporting false positive results. The Seized Drugs section is currently planning on expanding this decision-point assay method to also encompass other sample types that could contain delta-9-THC such as food products and oils.

Internal Issues

OSAC implementation

In December 2018, the Board of Directors voted to voluntarily adopt and incorporate the Organization of Scientific Area Committees (OSAC) registry standards. The resolution gives the CEO authority to determine each standard's applicability (in full or in part) to HFSC's laboratory operations. Per this resolution, once a standard is published on the registry, HFSC has one year to establish compliance. The following six standards have been successfully adopted and incorporated into HFSC's management system:

Interdisciplinary

- ISO/IEC 17025:2017, General Requirements for the Competence of Testing and Calibration Laboratories

Seized Drugs

- ASTM E2329-17, Standard Practice for Identification of Seized Drugs
- ASTM E2548-11e1, Standard Guide for Sampling Seized Drugs for Qualitative and Quantitative Analysis

Toxicology

- ANSI/ASB 037, Best Practice Recommendation, Guidelines for Opinions and Testimony in Forensic Toxicology, First Edition, 2019
- ANSI/ASB Standard 017, Standard Practices for Measurement Traceability in Forensic Toxicology, First Edition, 2018

Crime Scene

- ISO 21043-2, Forensic Sciences - Part 2: Recognition, recording, collecting transport and storage of items

To aid in meeting deadlines and the number of registry standards per section, an internal spreadsheet was created that keeps track of the status of standards added to the registry. The spreadsheet includes the standard name, the applicable section(s), the status, and the number of working days needed to incorporate the pertaining standard into their procedures.

To date, HFSC is currently working towards the implementation of eight additional standards that were added to the OSAC registry during this review period. One of these standards includes ASTM E2917-19 "Standard Practice for Forensic Science Practitioner Training, Continuing Education, and Professional Development Programs". The implementation strategy for this interdisciplinary standard included the formation of a Continuing Education Committee which created a guide with an hour/point level system for different types of learning opportunities and a Qualtrax workflow to document and measure the number of hours of training the forensic practitioner has taken. In addition, a PowerBi Dashboard was created as a quick reference visual that tracks and captures all the training and learning opportunities taken by the forensic practitioner once the Qualtrax workflow has been reviewed and approved by section management. A checklist with the training program requirements from this standard was created to aid in the incorporation of these clauses to current training manuals. The Quality Division is actively working with all technical sections in the incorporation of these requirements in their training manuals.

Move to Jefferson

HFSC successfully relocated all technical and administrative sections to the new facility located at 500 Jefferson by November 2019. HFSC was fully functional by the end of December 2019. The following sections in the table below drafted memos that were signed by Quality indicating the appropriate quality control checks had been performed on instrumentation used in casework.

Section	Date Authorized to Resume Casework
Firearms	November 2019
Forensic Biology	November 2019
Latent Prints	October 2019
Toxicology	December 2019
Seized Drugs	November 2019

The new facility continues to meet or exceed expectations. To date there have been no environmental issues that have affected casework activities.

HFSC hired an outside security consulting team to perform a security audit of the new facility. Several security risks to the physical facility were identified and remediated.

Board of Directors Changes
Retired Assistant Chief Mary Lentschke was named Vice Chairwoman of the Board of Directors in November 2019 and reappointed in June 2020. There were also several additions to the board this year. Directors Lois Moore and Vicki Huff both joined the board in February 2020 and Director Ellen Cohen joined the board in July 2020.

Quality Division Changes
The Quality Division gained a new Specialist, Marisa Randall, formerly a Crime Scene Investigator at HFSC, in February 2020. Ms. Randall relocated to another country which resulted in her leaving the Quality Division in September 2020. The Quality Division is now currently hiring for this empty position/vacancy.

Suitability of Policies and Procedures

The mission of HFSC is to receive, analyze, and preserve physical and digital evidence while adhering to the highest standards of quality, objectivity, and ethics. To meet these expectations, sectional policies and procedures are controlled, reviewed, and revised as necessary. Technical documents are maintained in Qualtrax and can also be viewed by the public through an eDiscovery link on HFSC's website. Corporate policies and procedures are accessed through the HFSC intranet or directly through Qualtrax. This past year, all technical procedures were reviewed as part of the internal audits. Overall, the policies and procedures were determined to be suitable to the mission of HFSC and revisions were made as needed.

Many management system documents, including sectional SOPs, training manuals and worksheets, were revised during the timeframe of this management review. However, there was one internal audit nonconformance for the Forensic Biology section where several controlled documents were not updated on a timely basis. For more information on this nonconformance, please refer to the 2020 Internal Audit Report.

Revisions were made for various reasons, including, but not limited to, improving best practices, ensuring compliance with accreditation/OSAC registry standards, ensuring clear understanding of the expectation of the document by staff, and in response to corrective and/or preventive actions. Please see Qualtrax for specific information regarding each revision. In instances when controlled documents were not revised, section management documented a review of the document in accordance with Quality Manual requirements. Documentation of these yearly reviews is also maintained in Qualtrax.

Manager and Supervisor Reports

HFSC compiles manager and supervisory information that is shared monthly with the HFSC Board of Directors. This information includes, but is not limited to:

- Case metrics including requests received, requests completed, turnaround times, and backlogs per discipline
- Testimony metrics including the number of courtroom testimonies that have been monitored and the number of completed transcript reviews
- Audits and assessments
- Incidents/Corrective Actions/Preventive Actions
- Blind quality control and proficiency testing programs
- Budget

The operations metrics and quality information are further discussed at bi-monthly company-wide meetings that are open to all HFSC staff and recorded for future viewing.

Details pertaining to reports shared with or presented to the Board of Directors can be viewed by clicking http://houstonforensicscience.org/meeting-archives.php or viewed real time via live stream. Metrics are also posted on HFSC's public website and are updated monthly.

Internal Audits

The Quality Division conducted internal audits of all technical sections. Audits were conducted in accordance with the calendar shown below. Also included on the calendar are other related/important activities such as last year's management review, the ANAB on-site relocation assessment, ANAB remote surveillance assessment to ISO 17025:2017 and AR 3125 requirements, and training provided by the Quality Division.

2019-2020 HFSC Quality Division Calendar

October '19

S	M	T	W	T	F	S
		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
27	28	29	30	31		

2019 Management Review

November '19

S	M	T	W	T	F	S
					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	27	28	29	30

December '19

S	M	T	W	T	F	S
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	27	28
29	30	31				

January '20

S	M	T	W	T	F	S
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5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

TFSC Training

ANAB Premise Assessment

February '20

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
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16	17	18	19	20	21	22
23	24	25	26	27	28	29

March '20

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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

April '20

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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

LP Internal Audit

DME Internal Audit

CSU Internal Audit

Tox Internal Audit

May '20

S	M	T	W	T	F	S
					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	27	28	29	30
31						

FBIO Internal Audit

FA Internal Audit

SD Internal Audit

June '20

S	M	T	W	T	F	S
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Audit Report & Checklist

July '20

S	M	T	W	T	F	S
			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	27	28	29	30	31	

ANAB Surveillance Visit

August '20

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September '20

S	M	T	W	T	F	S
		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
27	28	29	30			

Dickson Temp QC Checks

Due to COVID-19, internal auditor training could not be completed and therefore this year's internal audit was completed by the Quality Division. These internal audits were a combination of both virtual and on-site auditing to minimize exposure. All members of the Quality Division were either a trained assessor, certified quality auditors, or received internal audit training provided by the Quality Division in 2019. Technical sections provided assistance in the internal audit by helping with case record reviews.

Internal audits were conducted using the ISO/IEC 17025:2017 standard, ANAB supplemental requirements, the 2011 FBI Quality Assurance Standards (QAS) for DNA Testing Labs, the HFSC Quality Manual, and current section policies and procedures. A total of 12 nonconformances were noted during these audits. As of October 1st, six of these (three from Forensic Biology and three from Crime Scene) remain open.

2020 Internal Audit Nonconformances Pending Closure

There are six total nonconformances from the internal audit that are pending closure as of October 1, 2020. For more detailed information please refer to the 2020 Internal Audit Report.

- The Forensic Biology section currently has three nonconformances pending closure:
  - One incident (2020-IA-11)
  - Two corrective actions (2020-IA-06 and 2020-IA-07)
- The Crime Scene Unit currently has three nonconformances pending closure:
  - One incident (2020-IA-02)
  - Two corrective actions (2020-IA-03 and 2020-IA-09)

2018 Internal Audit Nonconformance Update

- The Forensic Biology section corrective action 2018-IA-09 is pending the conclusion of an audit in which approximately 1280 profiles are being evaluated to determine if they were entered into CODIS correctly. Thus far the Forensic Biology section has reviewed over 957 profiles or approximately 75% of the profiles that need to be reviewed.

External Assessments

ANAB performed an on-site assessment of HFSC's new facilities in January of 2020. The assessment focused on the structural requirements, facilities, environmental conditions, equipment and personnel requirements related to the new location. There were no nonconformances identified during this assessment. HFSC's accreditation was extended to the 500 Jefferson location on February 13, 2020.
A remote surveillance assessment by ANAB was completed during the month of July 2020. HFSC was assessed to a portion of ISO/IEC 17025:2017 clauses and supplemental requirements that focused on metrological traceability, validation of methods, technical records, evaluation of measurement uncertainty, ensuring the validity of results, reporting of results, corrective actions, internal audits and the Forensic Biology section. There were no nonconformances identified during this surveillance assessment and our accreditation was continued.

An updated version of the FBI Quality Assurance Standards for Forensic DNA Testing Laboratories became effective July 1, 2020. A QAS external audit was conducted by ANAB in October 2020. This assessment was performed by three assessors: one who came on-site and two who were remote. There were no nonconformances identified.

Nonconformances: Incidents and Corrective Actions

Incidents and corrective actions are tracked by the Quality Division using an Access database and Qualtrax. During the time frame covered within this review, the following were documented by the Division:

- 25 Corrective Actions
    - 5 were related to the 2020 internal audit
- 80 Incidents
    - 7 were related to the 2020 internal audit

Four of the above corrective actions involved HFSC's proficiency testing program. In the first corrective action a Latent Print participant discussed his results with a co-worker prior to submitting the test results. Please refer to corrective action report 2019-080 for more information. The second involved a Crime Scene proficiency test missing a documentation packet from the case file. The related corrective action report, 2020-038, remains open at the time of this review. In the third, the Latent Print participant didn't list the subject names for comparisons in the worksheet. The related corrective action report, 2020-043, remains open at the time of this review. The fourth involved a Crime Scene proficiency test where the results were inconsistent with the proficiency test provider's consensus report. The related corrective action report, 2020-069, remains open at the time of this review.

Completed incident and corrective action reports are added to LIMS as case reports viewable by stakeholders authorized to access LIMS when they are affiliated with specific cases. Completed incident, corrective action, follow-up, and preventive action reports are also available for review through HFSC's public eDiscovery website (http://www.hfscdiscovery.org/).

Turnaround Time

The HFSC nonconformance turnaround time (TAT) goal between notification to the Quality Division and close out is 30-working days for incidents and 50-working days for corrective actions. This new TAT was implemented in the November 15, 2019 Quality Manual revision. Before this revision the TAT goal was 40-working days for the Forensic Biology and Latent Prints sections and 30-working days for all other disciplines. The overall TAT for incidents and corrective actions for this management review period and the last three years are depicted in Figure 1. This management review period's TAT was significantly impacted by the pandemic and the remote internal audits completed by the Quality Division which consequently prevented the Quality Division from achieving these goals.

(**Note:** All the following figures' TAT and number of nonconformances, unless otherwise specified, were calculated from closed out nonconformances using network days at the time this review was conducted. The data from previous years (such as average TAT) may vary from previously-issued management review reports because the metrics are continuously updated as nonconformances are closed.)

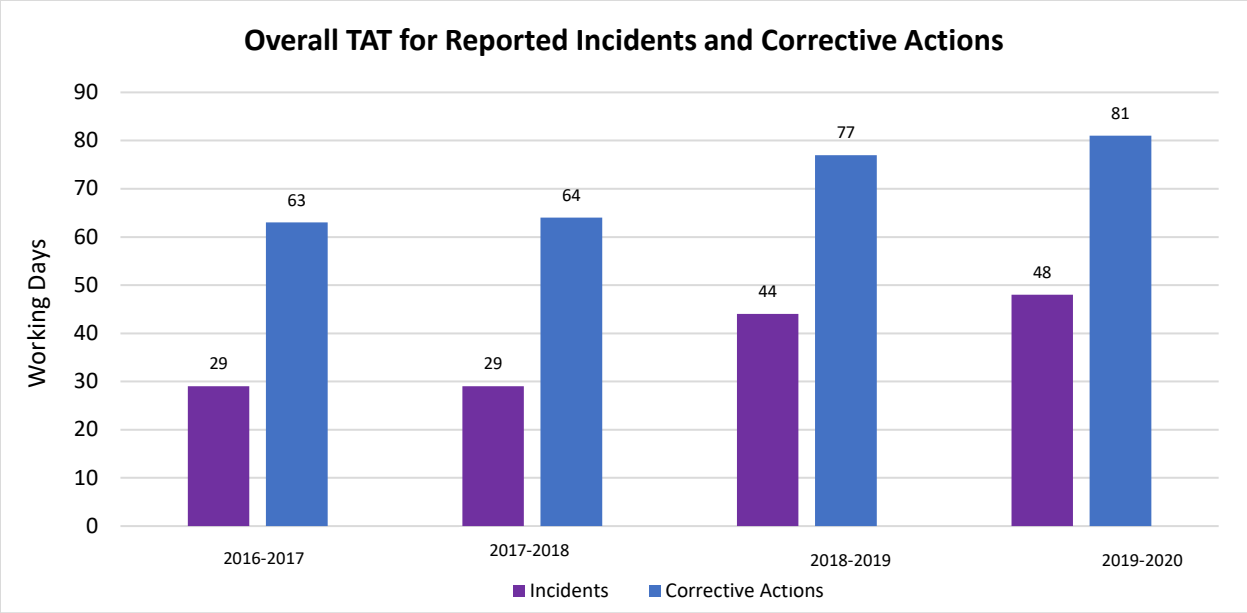

Figure 1. *Overall combined TAT for all reported nonconformances over the last four years (Oct through Sept).*

A more detailed overall TAT for closed out nonconformances by technical and administrative sections over the last four years is depicted in Figure 2.

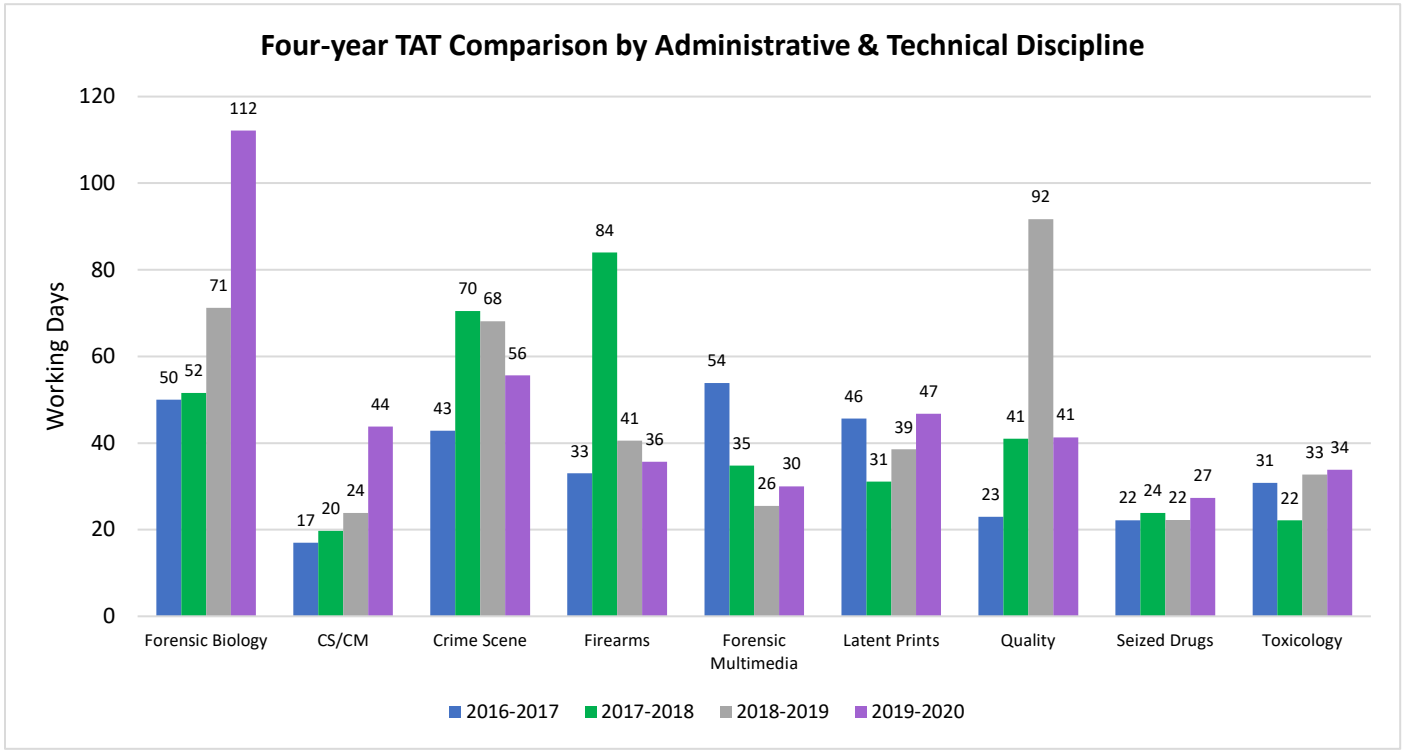

Figure 2. *Four-year turnaround comparison by administrative and technical sections.*

Figure 3 is a more detailed comparison for each section's TAT compared to the number of nonconformances closed out for this review period.

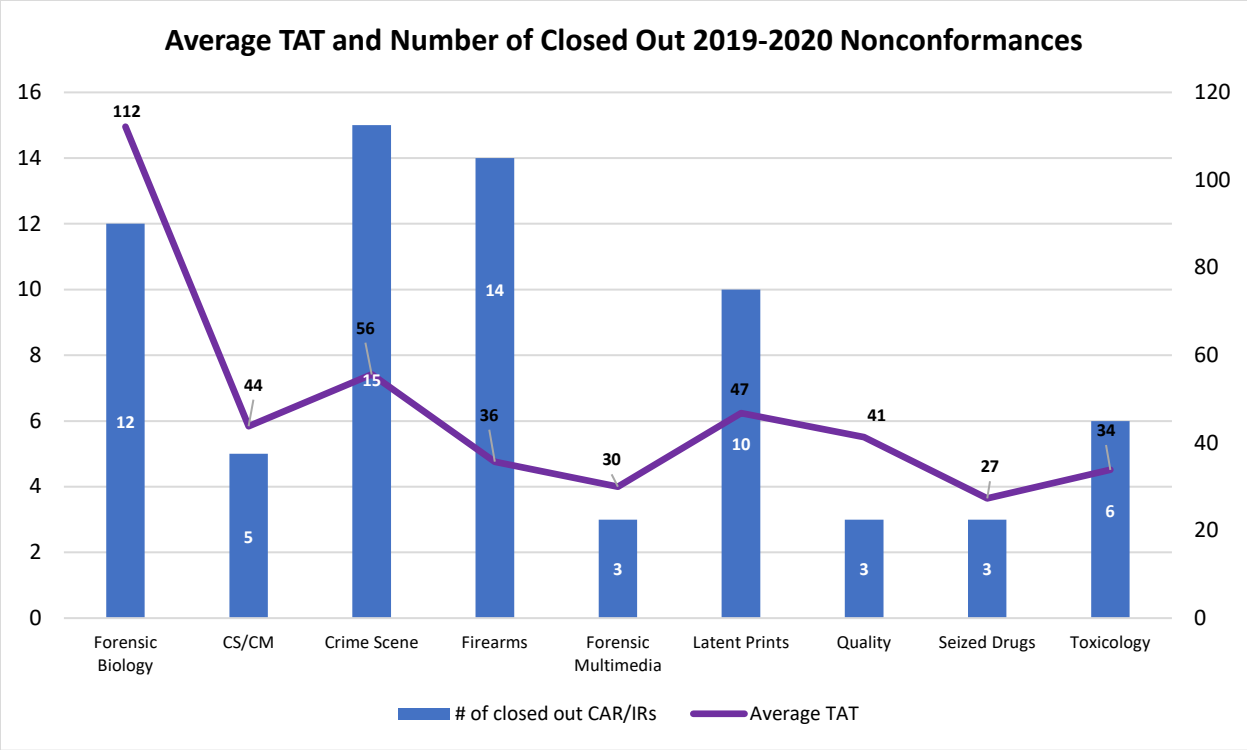

Figure 3. *Average TAT and number for closed out for 2019-2020 nonconformances.*

At the time of this review, a total of 34 open nonconformances were in the process of being closed out; refer to Figure 4 for a breakdown of these nonconformances listed by section.

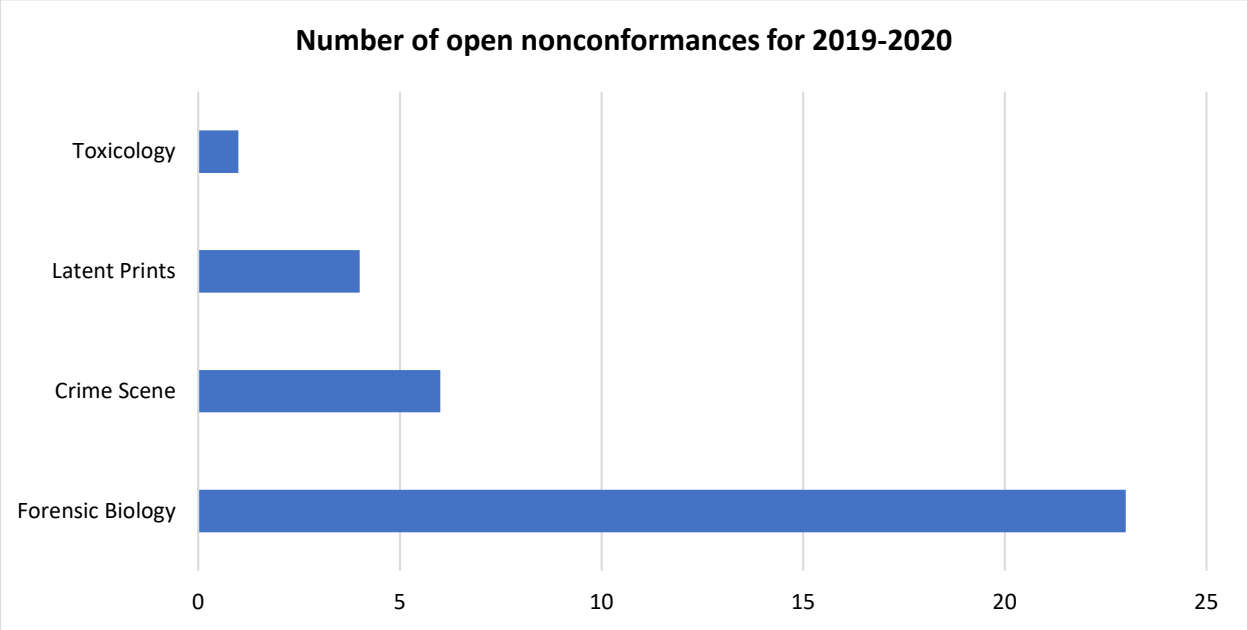

Figure 4. *Number of open nonconformances for 2019-2020 management review period per section.*

The following graph (Figure 5) shows a five-year trend of the overall number of nonconformances and turnaround times listed by section.

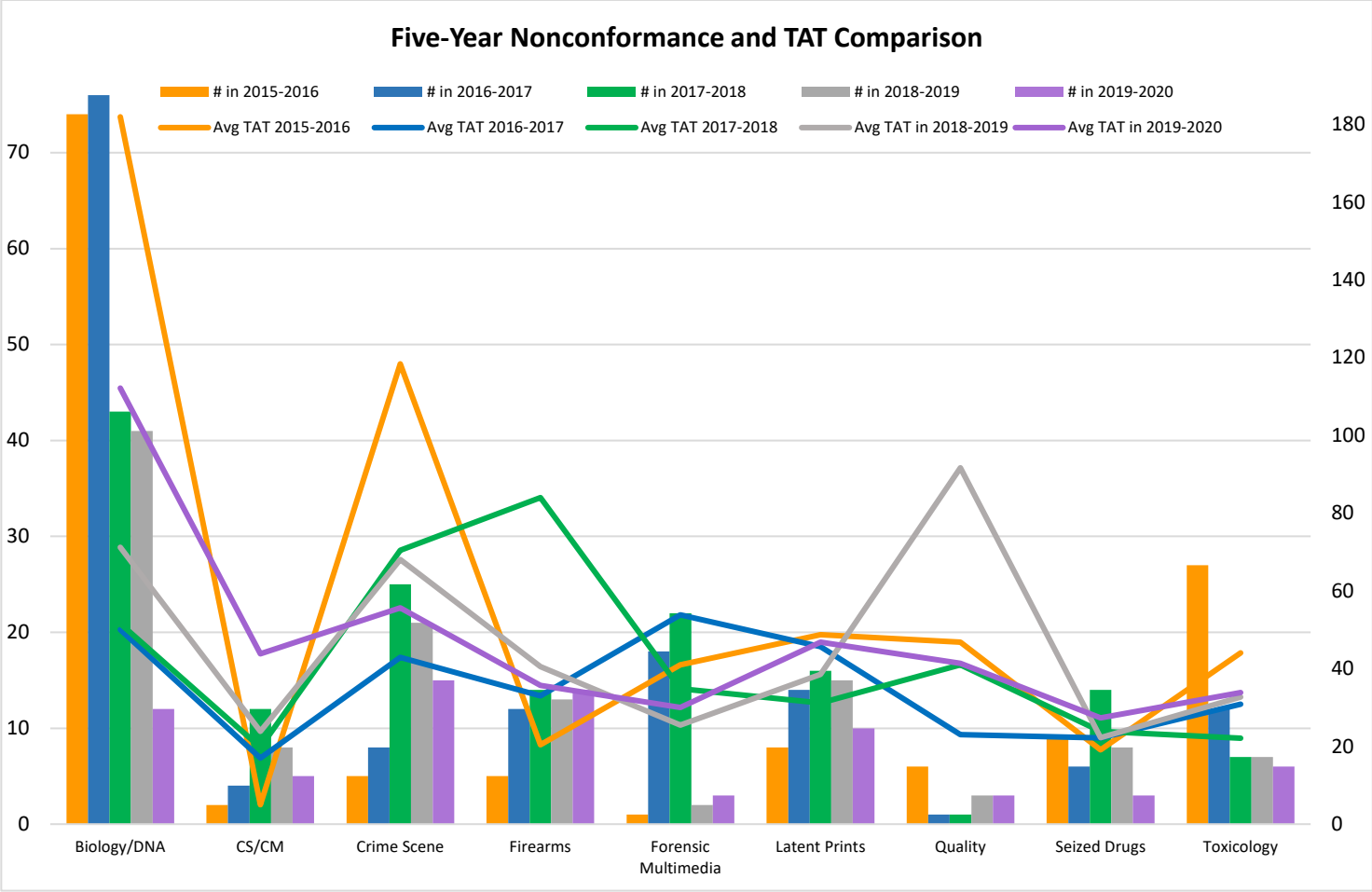

Figure 5. *Five-year nonconformance and TAT comparison listed by section.*

Source of Nonconformance Review

Corrective actions and incidents tracked by the Quality Division are categorized by nonconformance type.

The most common nonconformances category type for this management review period was “failure to follow policy” as depicted in Figure 6. The Quality Division conducted further research to determine if the failure to follow policy was more commonly attributed to a failure to follow sectional procedures, failure to the Quality Manual (QM) or a failure to follow other HFSC policies, such as those listed in the HFSC Health and Safety Manual or the Security Manual. Each nonconformance was reviewed and re-categorized as either “failure to follow QM” if the requirement was only listed in the Quality Manual or “failure to follow SOP” if the requirement was section-specific or if the policy further expanded on a Quality Manual requirement. Lastly, nonconformances remained as “failure to follow policy” if they failed to follow another HFSC policy. As depicted in Figure 7, the majority of these nonconformances was attributed to not following sectional procedures.

Please refer to Recommendations for Improvements for recommended actions to address this nonconformance type.

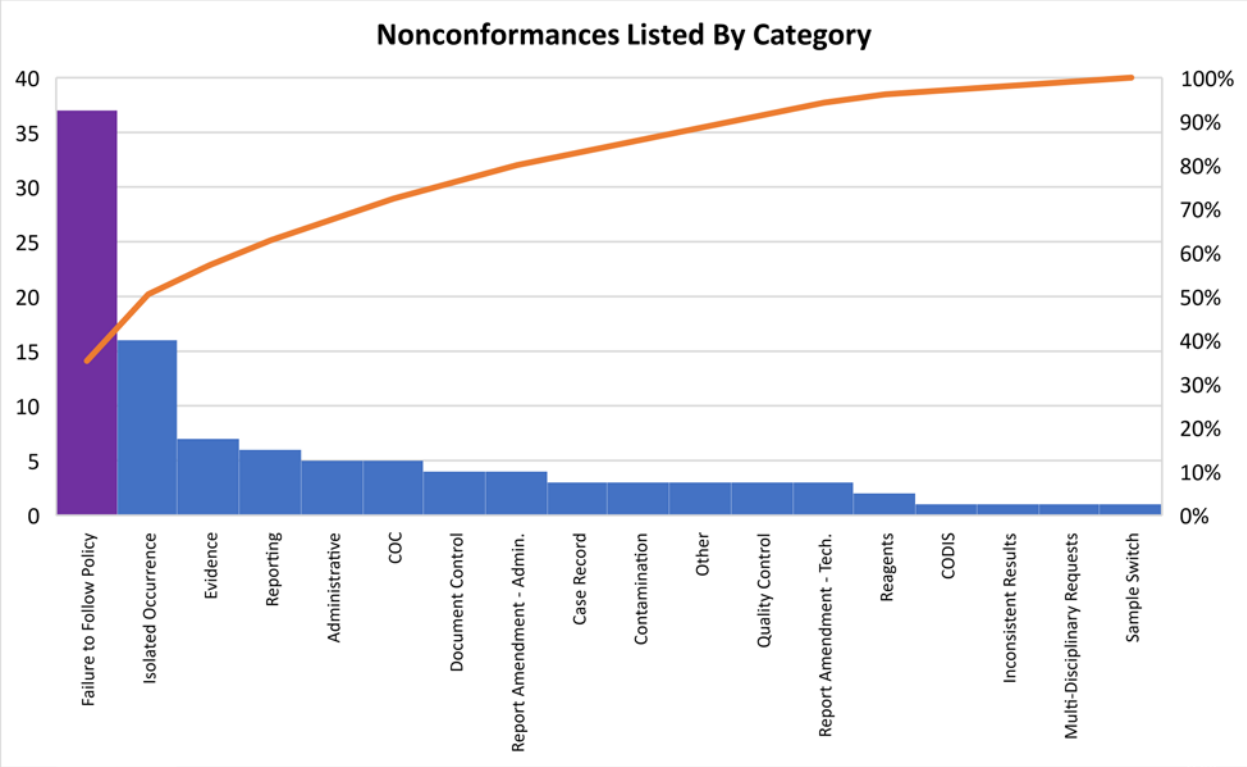

Figure 6. *Nonconformances for 2019-2020 management review period listed by category.*

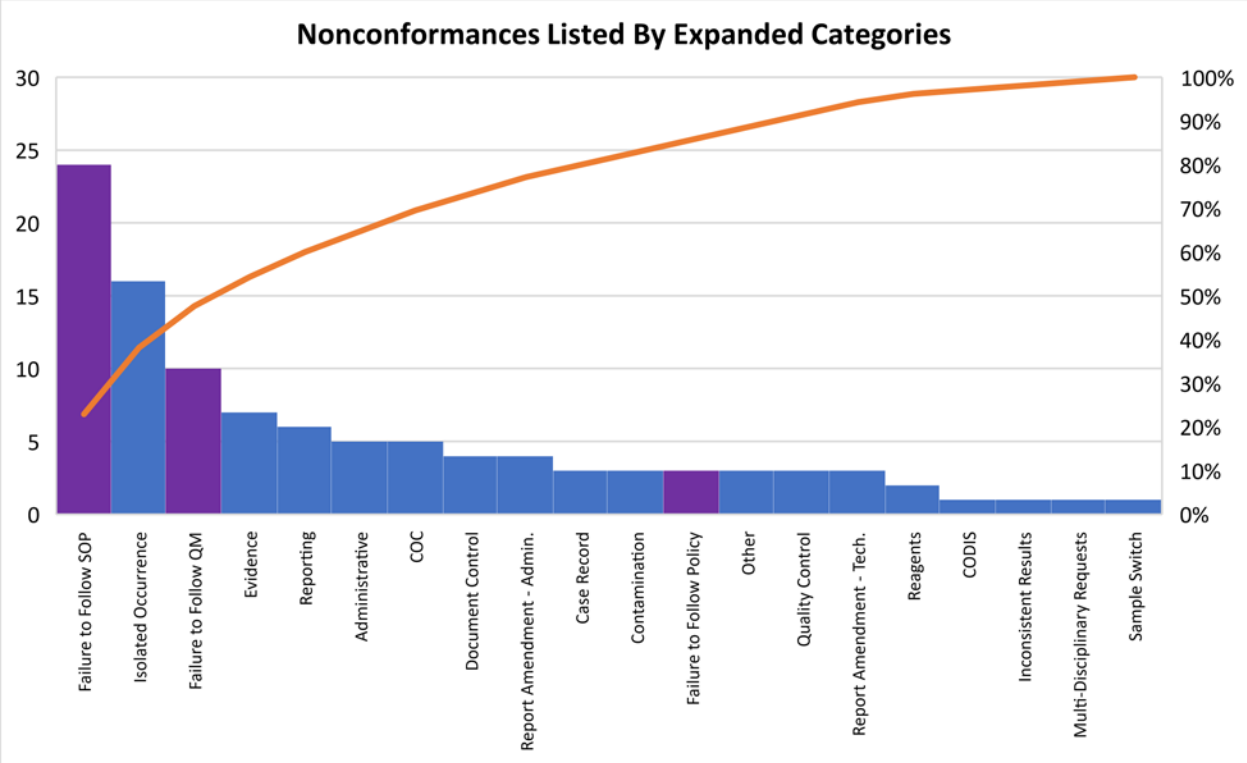

Figure 7. *Nonconformances for 2019-2020 management review period listed by expanded categories.*

Improvements to the Nonconformance Process

Improvements to the nonconformance process are achieved by being preventive rather than reactive by actively looking at processes and identifying areas that may need improvements through the preventive action workflow. Another improvement method used is the evaluation of actions taken for previously closed out incidents and corrective actions to determine if they were sufficient in addressing and improving the affected processes through a follow-up workflow. As such, this year's performance review goal for the Quality Division included completing at least one preventive action and/or a follow-up workflow per Quality Specialist.

Preventive actions are tracked by the Quality Division using an Access database and Qualtrax. During this review timeframe, 6 preventive actions were documented by the Quality Division.

Involved Sections	Preventive Action #
Forensic Biology, Seized Drugs, Firearms, Forensic Multimedia, Latent Prints, Toxicology	2019-PAR2
CS/CM, Seized Drugs, Latent Prints	2020-PAR1
Forensic Biology	2020-PAR2
Firearms, Quality	2020-PAR3
Latent Prints	2020-PAR4
Crime Scene	2020-PAR5

Follow-ups are tracked by the Quality Division in Qualtrax and a total of 7 workflows were initiated during this review timeframe.

Section	Follow-up to IR/CAR
CS/CM	2018-059
Firearms	2020-IA-10
Forensic Biology	2018-070
	2019-009
	2019-034
Latent Prints	2018-040
Forensic Multimedia	2019-071

As part of last year's management review, in order to increase awareness and to effectively communicate with sections about nonconforming work, the Quality Director emailed a report to all managers on a monthly basis summarizing the nonconformance notifications received by the Quality Division for the previous month. It is now no longer necessary to email this information because there is a new Quality Dashboard which allows section management and staff members to view nonconformances being tracked by the Quality Division on a company-wide level.

Results of Risk Identification

Risk assessments were conducted for the Latent Prints, Firearms, Crime Scene Unit, Forensic Multimedia, and Forensic Biology sections by the Quality Division in conjunction with the Lean Six Sigma (LSS) Development Group. The purpose of these assessments was to identify existing and potential risks associated to analytical processes and workflows, and to implement safeguards and/or quality controls to mitigate the identified risks. The tools used to complete this assessment were high level process

mapping, SIPOC analysis, brainstorming and failure mode and effects analysis (FMEA). Several risks were identified and are being mitigated through the preventive action process. At the time of this management review, these preventive actions are still pending.

Assurance of the Validity of Results

Proficiency Testing

Analysts completed proficiency tests in accordance with accreditation standards, QAS requirements, and HFSC policies. Tests were obtained from ISO/IEC 17043 accredited vendors Collaborative Testing Services, Inc. (CTS), Forensic Assurance (FA), and the International Society of Forensic Computer Examiners (ISFCE). The following non-accredited vendors were also used: College of American Pathologists (CAP) and Resolution Video (ResVid). ANAB previously approved the use of the Resolution Video proficiency tests for Forensic Multimedia and an internal proficiency program for the Crime Scene Unit. ANAB approved external proficiency test providers for Crime Scene late in 2018. The tests are specific to body fluid identification and latent print processing.

See the chart below (Figure 8) for the total number of internal and external proficiency tests distributed for each discipline between October 1, 2019 and September 30, 2020. Please refer to the Incidents, Corrective Actions, and Preventive Actions section, for more information regarding two Latent Prints proficiency tests involved in corrective action reports 2019-080 and 2020-043 and Crime Scene proficiency tests that were involved in corrective action reports 2020-038 and 2020-069 (results are still pending further review).

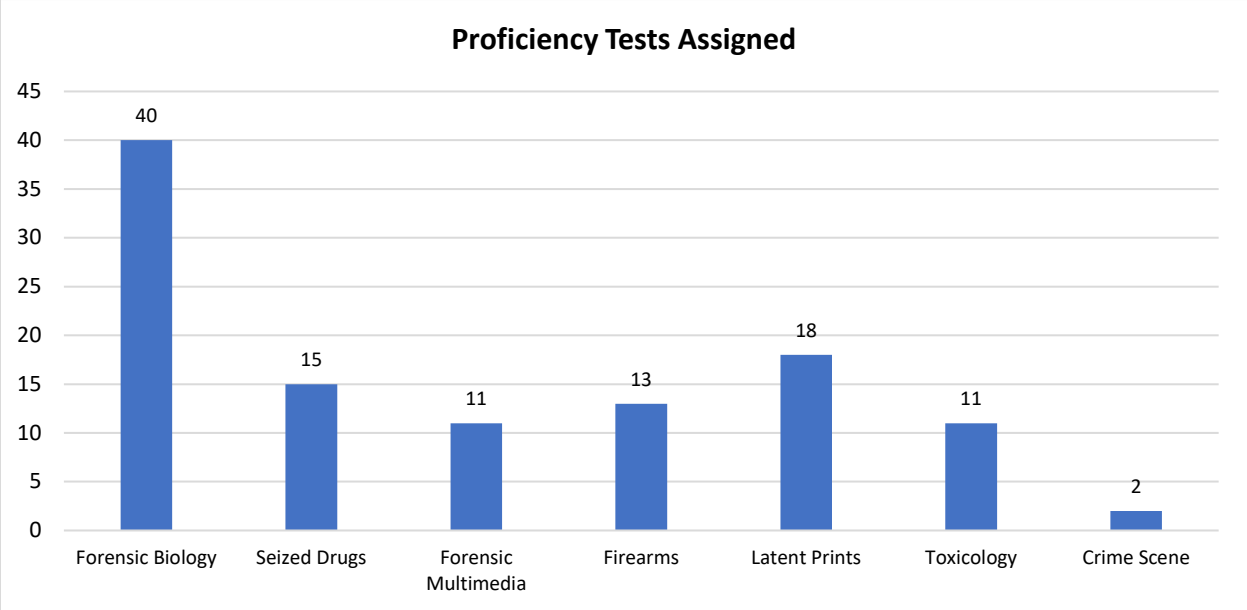

***Figure 7**. Proficiency tests assigned for all technical sections between October 2019 through September 2020.*

As of September 30, 2020, the Crime Scene Unit completed one external body fluid identification proficiency test and one external fingerprint processing proficiency test. This is the first time CSU participated in an external fingerprint processing proficiency test.

Blind Quality Control Testing

The blind quality control (QC) program was initiated in 2015 as a means to supplement proficiency tests, monitor the entire quality management system, and provide opportunities for process improvements. Blind QC cases added to sectional workflows and blind verifications (BV), where applicable, from the previous review period and the current review period are shown below.

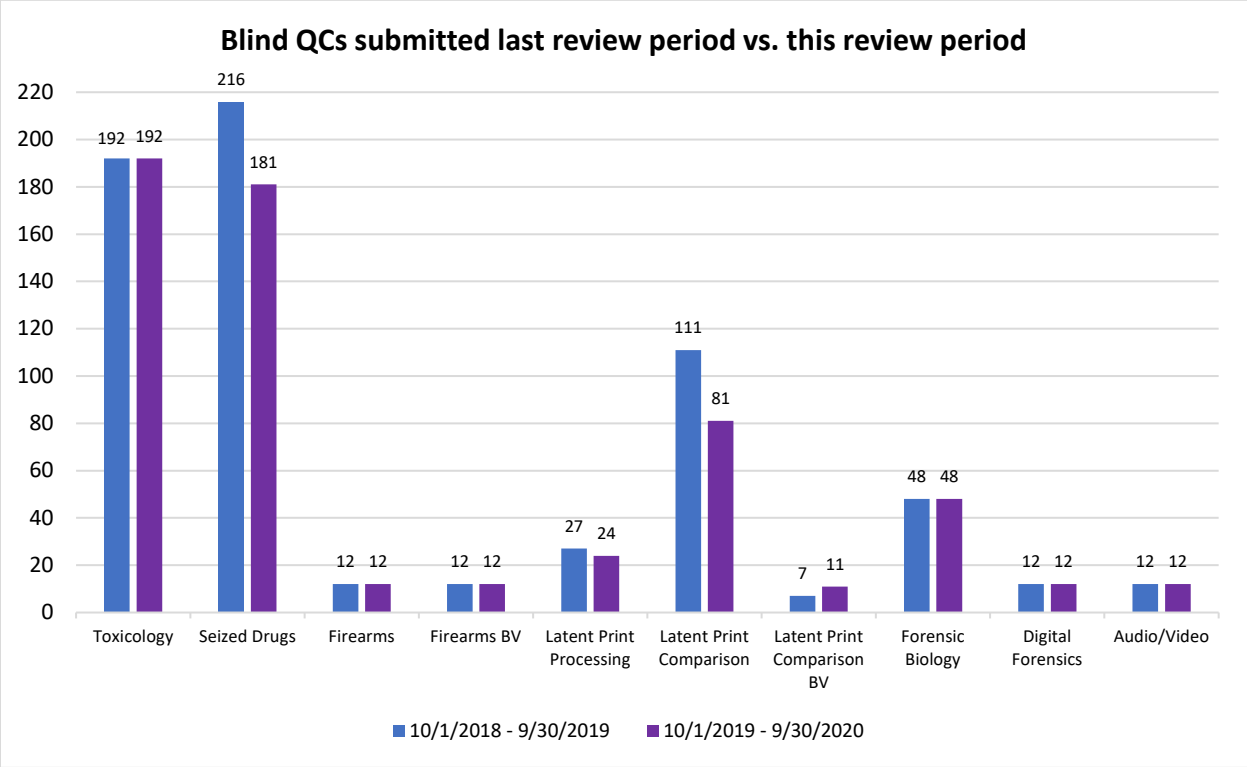

***Figure 8**. Blind QCs Submitted Comparison.*

To date, there have been no unsatisfactory results in a blind QC case. This information shows that our policies and procedures are reliable for the work being done and that analysts are competent and proficient in their work. The Quality Division prepares a report on a quarterly basis to notify the participating sections of the importance of blind QCs, the number of blind QCs each staff member has completed, results, instruments used and other information that may be used to track trends within the section.

During this review period, three Toxicology blind QCs and two Forensic Biology blind QCs were reported with unexpected results. A Toxicology blind QC was reported with a concentration that was inconsistent with the expected concentration. The Quality Division initiated an investigation. Evidence from the investigation indicated that the error occurred at the manufacturing level. A memo regarding the findings of the investigation was written and attached to the Blind QC Quarter II 2020 report which was uploaded onto HFSC's eDiscovery site. The other two Toxicology blinds were reported with a lower concentration than what has been reported for other samples in that same lot. The originally tested blood tube from the first case of this instance was retested by the Toxicology section and received consistent results. The other two tubes in that case were tested and returned concentrations that were consistent with the originally report concentration. The first kit was sent to NMS to test for preservative concentrations and these results were consistent with expected concentrations. The believed cause for the lower concentration is a nonhomogeneous mixture of the blood samples during manufacture, but at

this time a definitive explanation has not been discovered. A memo regarding the findings of this investigation is pending at the time of this review.

Two Forensic Biology blind QCs were reported as mixtures when the submission was intended to be single source. The evidence submitted consisted of contact swabs donated by two different Quality Division personnel. After investigation the foreign DNA profile in one mixture was determined to be from the Quality Division staff member's family member. The mixture in the second blind was more complex and the source of the foreign DNA contributors could not be determined. In both blind QCs the results were generated by an outsource laboratory but were reproducible upon reanalysis by the Forensic Biology section.

The Quality Division submits blinds at a rate equivalent to approximately 5% of casework output from the previous year in each section with the exception of CSU. CSU does not participate in the blind QC program.

The chart below shows the 5% of casework goals for each section for 2019 and 2020. Changes in section output per month from 2019 to 2020 account for the change in the monthly goal.

Section	Target Cases Assigned 2019	Target Cases Assigned 2020
Toxicology	16/month	16/month
Seized Drugs	15/month	15/month
Firearms	1/month	1/month
Firearms Blind Verification	1/month	1/month
Latent Print Processing	2/month	2/month
Latent Print Comparison	9/month	6/month
Latent Print Blind Verification	1/month	1/month
Forensic Biology	4/month	4/month
Digital Forensics	1/month	1/month
Audio/Video	1/month	1/month

Some obstacles associated with the blind QC program were addressed during the review period. These include:

- Last review period, HFSC obtained forfeited mobile devices from HPD to allow us to submit Digital Forensics blind QC cases that more appropriately mimic casework. This also supplies the Quality Division with sufficient samples to meet the 5% monthly goal. During this review period, a Quality Specialist was given permission to run the destruction query which allows for more frequent monitoring of suitable devices.
- The same Quality Specialist was also given permission to run the destruction query for firearms.
- In December 2018, HPD began their own National Integrated Ballistic Information Network (NIBIN) unit. The implementation of this unit affected the workflow of the HFSC Firearms section which impacted the submission of blinds into the section. During this review period, HFSC found a workable bypass around the NIBIN process.

- Although Audio/Video blind QCs still present challenges regarding obtaining appropriate material to submit, additional methods for obtaining evidence for A/V blinds were utilized during this review period.

The following issues either have not been addressed since the 2019 management review or arose during the review period:

- Due to the pandemic, the latent print examiners have been working remotely full time. The section has not been able to access the county AFIS system remotely and have not been able to work blind QCs during this time.
- The Latent Print Comparison section is planning to change their workflow for AFIS searches. If this change does take place, the current method for submitting blind QCs will no longer be possible. Workarounds have been brainstormed and discussed, but there is currently no reliable option to continue to submit blinds in the Latent Print Comparison section.

Notable achievements related to the blind QC program during this management review include:

- A Quality Specialist presented on the blind QC program in blood alcohol analysis at the Society of Forensic Toxicologists, Inc. annual meeting.
- Quality personnel collaborated with Research and Development personnel to publish "Implementation of a Blind Quality Control Program in a Forensic Laboratory" in the Journal of Forensic Sciences. The article was recognized by Wiley Publishers as one of the top downloaded papers of 2018-2019.
- The Quality Director presented to the Council of Federal Forensic Laboratory Directors (CFFLD) on the blind QC program.
- HFSC personnel joined Center for Statistics and Applications in Forensic Evidence (CSAFE) personnel in presenting a CSAFE center-wide webinar regarding the blind QC program in latent prints.
- The Quality Division hosted a "swab-a-thon" during which several HFSC personnel volunteered to create buccal and contact swabs for Forensic Biology blind QC evidence. The timing of this event provided a significant amount of DNA evidence prior to the COVID-19 pandemic which disrupted regular laboratory procedures.
- Two Quality Division personnel participated in Virginia Commonwealth University's Forensic Science Seminar series by giving a lecture on the background, development, and processes of the blind QC program.
- HFSC celebrated the 5th anniversary of the blind QC program and achieved the milestone of submitting 2000 blind tests into the workflow since the program's inception.
- The Quality Division was invited to present on the blind QC program at the Texas Division of the International Association for Identification (Texas IAI) conference in June 2020 and the Association of Firearms and Tool Mark Examiners (AFTE) conference in May 2020; however, these conferences were cancelled due to the COVID-19 pandemic.
- An abstract was submitted to present at the American Academy of Forensic Sciences 2021 annual conference. This submission is pending acceptance.

Collaborations

HFSC participates in an ongoing collaboration with the Center for Statistics and Applications in Forensic Evidence (CSAFE). CSAFE is funded by National Institute of Standards and Technology (NIST) and consists of researchers from a consortium of universities. In the previous management review period, HFSC hired a Quality/Research Associate in a grant-funded position to assist with research related to error rates in latent

print analysis. During this review period, CSAFE's NIST partnership and funding was renewed for an additional five years.

HFSC's President and CEO serves on CSAFE's Strategic Advisory Board and a firearms examiner serves on the Research and Technology Transfer Advisory Board.

HFSC in collaboration with the U.S Army, accepted a Captain currently completing a two-year "U.S. Army Medical Department (AMEDD) Forensic Toxicology Fellowship" as a fellow in the Toxicology section. This position is funded by the Army; therefore, this fellow is considered active military personnel and still needs to complete required fitness tests and appear in military courts as an expert witness. Due to extensive toxicology experience, this fellow will focus on validation and method development in interpretative toxicology while completing their fellowship at HFSC.

Several additional grant-funded positions became available during this review period. These include positions in DNA and Research and Development.

Courtroom Testimony Review

Technical staff testimony is monitored at least once a year. If a technical staff member does not testify in a given year, they receive a non-testifying memo to document that they did not testify. Thirty-four analysts testified between October 1, 2019 and September 30, 2020; thirty-one were monitored and three were not. The transcripts were requested and will be reviewed by the end of 2020. Figure 10 shows technical staff that testified in the last three management review periods listed by section.

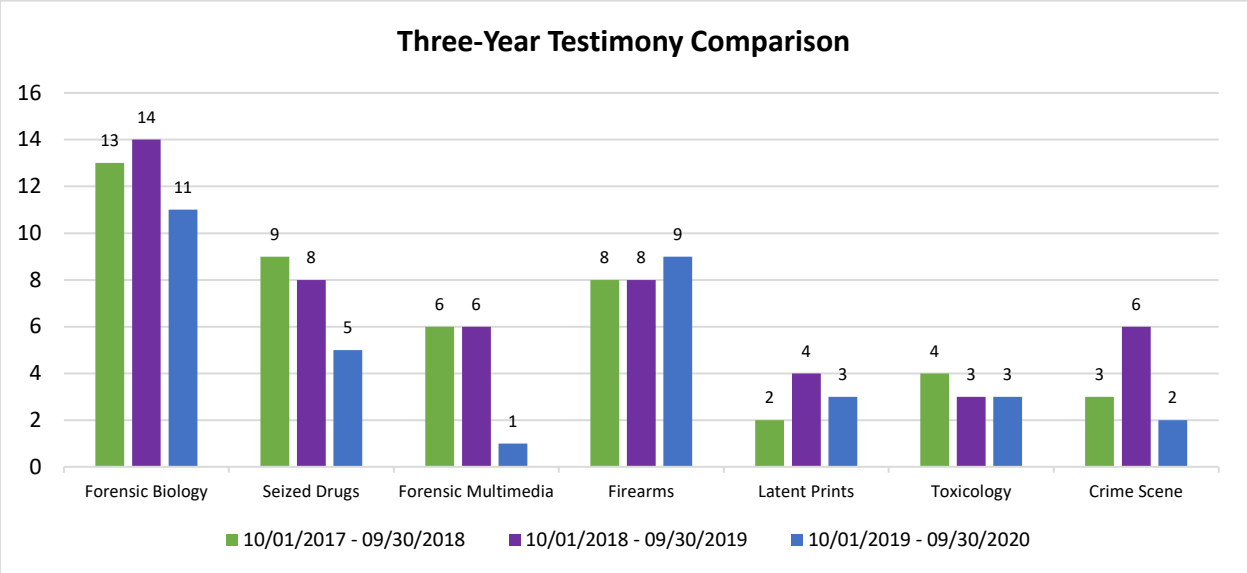

Figure 9. *Testimony comparison over the last three years listed by technical section.*

Transcript Review Project

HFSC started the Transcript Review Project in 2018 with the objective to identify areas of improvement and provide staff with tools and training to achieve improvement. The transcripts are requested from the Harris County District Attorney's Office (HCDAO) and/or the Harris County Public Defender's Office (HCPDO). The review process is completed by a committee composed of a technical staff member, Quality Division member and lay person.

During this management review period twenty-five transcripts were received and reviewed. The following graph (Figure 11) shows the number of transcripts reviewed per section during the last three years.

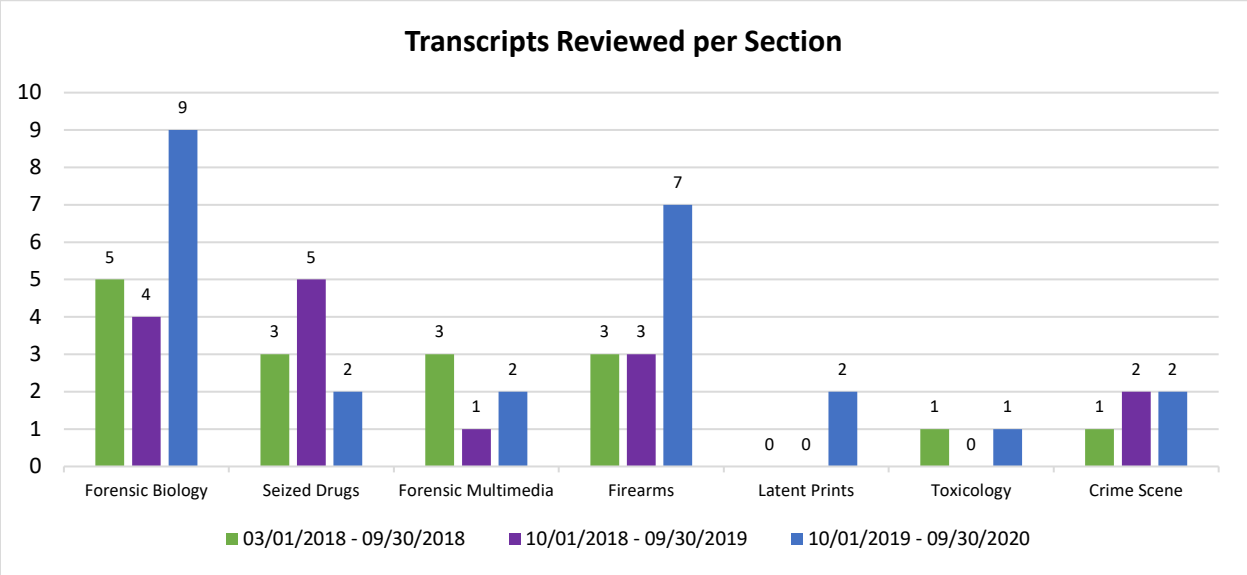

***Figure 10**. The number of transcripts reviewed by technical sections in the last three years.*

Improvements were made to the transcript review process during this management period. Staff are now required to review their own transcripts prior to the committee's review. The evaluation forms were also revised; separate forms were created for the individual committee members and for the final evaluation.

The transcript review project still faces some challenges. Transcripts are received from the HCDAO or HCPDO when cases are appealed, and these transcripts are provided to HFSC at no cost. Unfortunately, the number of cases being appealed fluctuates, and HFSC saw an increase in the number of transcripts received from these sources during this review period. HFSC's legal counsel now identifies appealed cases and provides a list to the Quality Division to request. This has helped increase the number of transcripts received for review. Figure 12 shows the number of transcripts requested vs. transcripts received during the last three years.

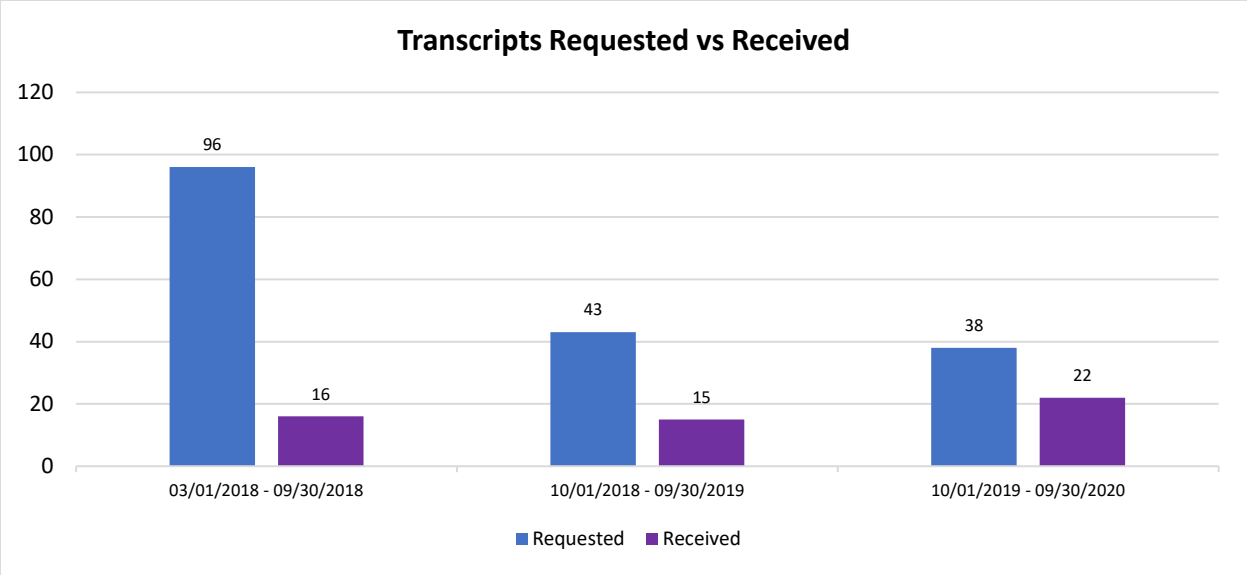

***Figure 12**. The number of transcripts requested vs received in the last three years.*

Two opportunities for improvement related to testimony were identified during this review period. One involved a Crime Scene Investigator (CSI) who testified beyond the scope of their expertise (refer to the self-disclosure section of this report for more information). This transcript review issue brought attention to the need to provide all staff with training regarding the limits of expert testimony. A training video was created, and all technical staff were required to watch the video and complete a test. The second involved providing additional testimony training to a staff member that allowed them to practice providing effective answers to commonly asked questions.

Redacted transcripts were provided to each section along with a cumulative list of questions asked by attorneys as a tool for sections to use during testimony training. Additionally, a transcript was received during this review period that provided a strong example of an effective testimony. A redacted version of the transcript was required to be reviewed by all technical staff.

Consultation and Conflict Resolution

During this review period, the Latent Prints section had 144 consultations regarding print quality and/or their suitability for AFIS searches. The section had 57 consultations regarding comparison conclusions. The differentiation between the two types of consultations was made available on December 9, 2019 due to the creation of a new report in JusticeTrax. These consultations were documented in accordance with the Latent Print Section Conflict Resolution and Consultation Procedures which was revised in July 2019. No conflicts arose during this time period.

The Firearms Section Consultation and Conflict Resolution Policy has been in effect since May 2018. During this review period, there were 16 consultations and no conflict resolutions. Section management finds the policy an effective means of resolving and documenting differences of opinions among analysts.

Adequacy of Resources

Casework Requests

Detailed information related to requests for analysis, turnaround times and average in-process analytical times are reported monthly to the Board of Directors. The monthly operations report is posted on the HFSC website at http://houstonforensicscience.org. Overall, the turnaround time for the majority of the sections increased for this review period. The increase in turnaround times can be attributed to the global COVID-19 pandemic. The impact to the turnaround time for cases and number of requests completed for this review period is depicted in Figure 13.

(**Note:** The number of requests completed and turnaround time data used for Figure 13 were compiled from HFSC's website.)

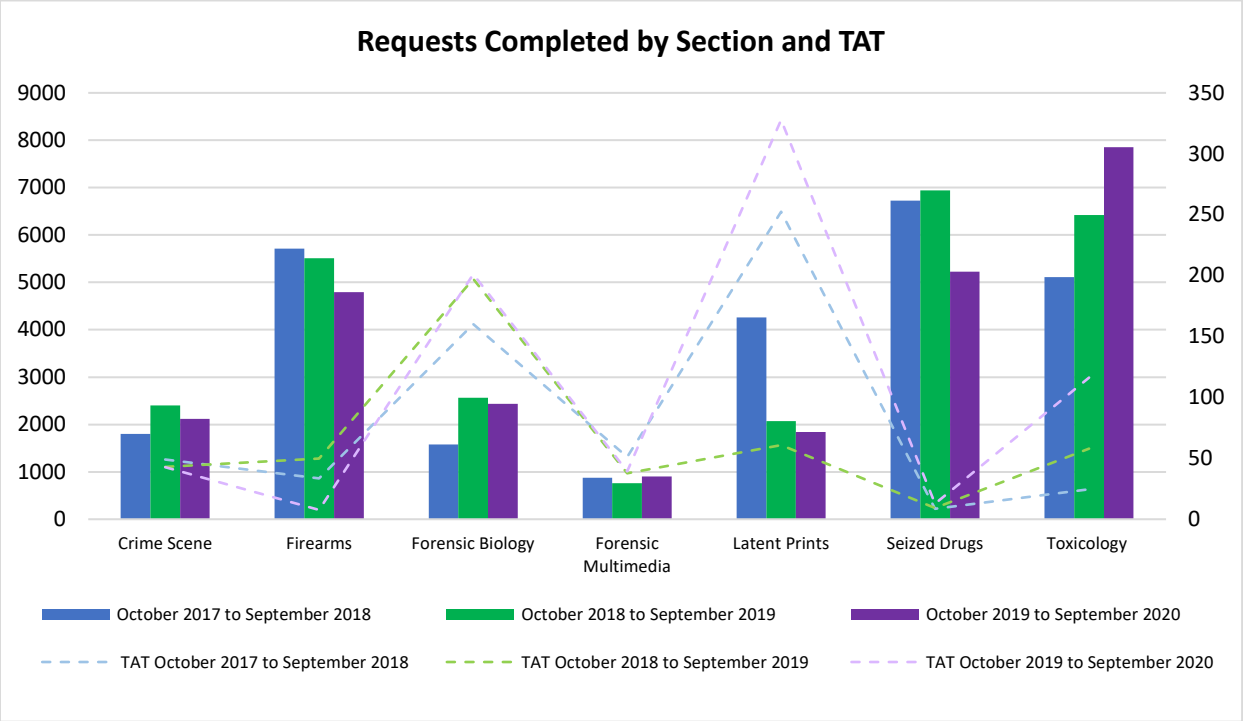

Figure 1113. *Requests completed and average turnaround time listed by section for 2018, 2019 and 2020 management review period.*

To be able to maintain a workable backlog through the global COVID-19 pandemic while minimizing human-to-human contact, the following were implemented:

- Sections modified schedules to allow for alternate shifts, off-site and on-site work, or working entirely remotely.
- In July, weekly COVID-19 testing was made available for staff members working on-site.
- Safety precautions, such as mandatory temperature checks and the use of PPE, were put into place.
- Chairs and tables were removed from common areas to encourage physical distancing.
- Masks were sewn by HFSC volunteers and provided to staff members.
- The Forensic Biology and Toxicology sections continued outsourcing cases.
- The Quality Division created a policy for transferring HFSC records off-site.
- A small conference room was set-up for remote video testimony.

- HFSC dedicated resources to purchasing laptop computers so that more staff could work remotely. The IT division also expanded HFSC's VPN capabilities and implemented a two-factor authentication process to improve security.

Scope of Accreditation

During this review period, there were no changes made to the services provided by HFSC that required an expansion/modification of ANAB's scope of accreditation. However, the Toxicology section is currently validating two Triple Quadrupole Liquid Chromatography/Mass Spectrometer (LC-QQQ) instruments which will require a scope expansion to include Liquid Chromatography as a new technology for both qualitative determination and quantitative measurement.

Calibration and Traceability

All critical equipment was calibrated by an external vendor accredited to ISO/IEC 17025. Instrumentation and equipment performance checks, calibration and services required per sectional SOPs were verified as part of the internal audits. There was one finding in the Crime Scene Unit related to documentation that instrumentation was verified to be fit for purpose prior to use in casework. Please see quality report 2020-IA-04 for more information.

Personnel

HFSC Human Resources (HR) Division ensured that positions were filled in a timely fashion.

The Latent Print manager, Tim Schmahl, left HFSC in September 2020, and the position was filled internally by the Technical Leader, Rebecca Green. The Technical Leader position is currently open. Additionally, the four latent print examiner trainees returned from off-site training in March 2020 and are working toward completing in-house training.

The Forensic Biology Technical Leader resigned her position in May 2020 and transitioned into a contract employee position. The acting Technical Leader position was assumed by Courtney Head, the Forensic Biology Manager, from May 2020 through September 2020. In September 2020, Cheron Maxwell, the DNA Training Coordinator, was promoted to the Technical Leader position. The DNA training coordinator position was then internally filled by India Henry in October 2020.

The Toxicology section was re-structured, and three internal applicants were promoted to supervisors. One of these promotions was given to the analyst fulfilling the Technical Leader position, a position that was filled during last year's timeframe. There are no plans to fill the vacant Technical Leader position since this individual is now supervising the confirmatory analytical process of the section.

Adequate staffing continues to be a challenge for HFSC's Crime Scene Unit. Three CSU supervisors left HFSC during this management review period, and all three positions were filled in-house by experienced CSIs, leaving three vacancies. Additionally, six other CSIs left HFSC during this review period, and one CSI remains on extended military leave. All positions have been filled, five with experienced CSIs, including one returning CSI, and five with new trainees. All five of the trainees were accepted into a 9-week crime scene course offered by the National Forensic Academy in Knoxville, TN.

Goods and Services

HFSC established a Logistics and Equipment Department that falls under the Finance umbrella. The Logistics and Equipment Department is responsible for the operations of the storeroom, including the receipt and distribution of supplies. The department assists in approving, evaluating, and ensuring effective communication with vendors that supply goods and services critical to HFSC's operation. They also played a key role in procuring adequate supplies, especially personal protective equipment, essential to the continued operation of HFSC during the COVID-19 pandemic.

Personnel Feedback

HFSC introduced the use of a 360-performance review for senior leadership in 2020. A 360 review solicits anonymous input from all levels of staff, including subordinates. The review is designed to provide actionable feedback to the employee and provides a better understanding of their contributions to the organization.

HFSC's HR Department was unable to administer the 2020 Employee Engagement Survey within the management review period due to the COVID-19 pandemic but intends to prior to the close of the 2020 calendar year.

HFSC continues to utilize company-wide goals as part of the employee performance evaluations. These goals are designed to promote quality, production, and employee development. The 2018 - 2019 goal of regularly scheduled one-on-one meetings between staff members and their supervisors was found to be an effective means of promoting discussion and feedback on job performance and was incorporated into the 2019 - 2020 company goals. One of the goals introduced in the 2019 - 2020 review period was for all HFSC employees to attend a minimum of 16 hours of continuing education.

Stakeholder Surveys and Complaints

Past attempts to solicit stakeholder feedback have been ineffective. To improve stakeholder feedback, a new survey was developed and a link to the survey is now included on all outgoing emails. The survey has been available to stakeholders since February 2020 and has proven to be effective. A total of 31 surveys were received (see Figure 14) within the management review period. The survey provides a comment field that is reviewed to determine if improvements are appropriate. Negative feedback is reviewed to determine if the survey response should be evaluated as a formal complaint. Actions were taken in response to one survey and another is currently being investigated by the Quality Division. A formal response was documented for any negative survey responses that was determined to be valid regardless of if personal contact information was provided by the respondent.

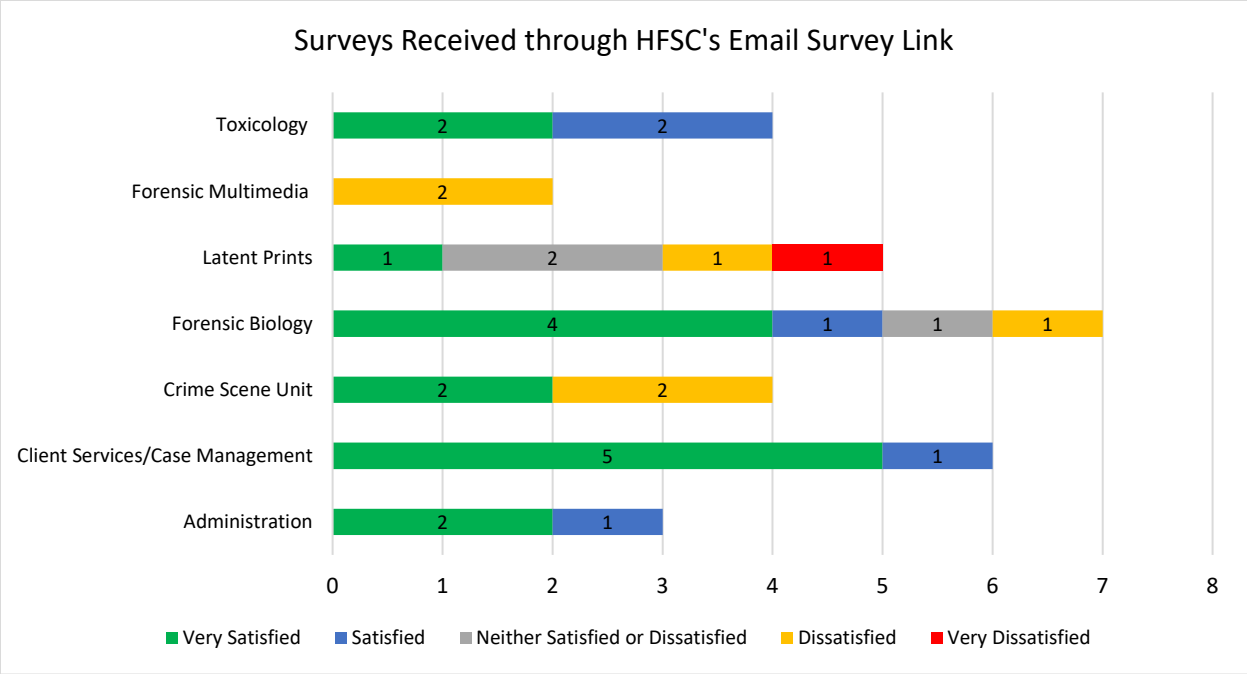

***Figure 14**. Surveys received through the link in HFSC staff email signatures.*

HFSC also provides access to a complaint survey through its outward facing website; however, no complaint surveys were received during this review period.

Additional Stakeholder Feedback

HFSC continues to receive stakeholder feedback through several additional means. These include, but are not limited to:

- Evaluations of training provided, and seminars hosted by HFSC
- Meetings between HFSC executive staff and high-ranking officials of the Houston Police Department
- In-person communications with stakeholders such as San Jacinto County Sheriff's Office
- Business development meetings and tours with numerous agencies in the surrounding area
- HFSC internal and external newsletters
- Community outreach opportunities

Texas Forensic Science Commission Complaints and HFSC Self-Disclosures

There were no complaints filed with the Texas Forensic Science Commission (TFSC) for this year's management review period. To query complaints filed with TFSC, this information can be found at https://txcourts.gov/fsc/case-status/complaints/.

One self-disclosure was filed with TFSC involving the Crime Scene Unit (transcript testimony)

- The Crime Scene self-disclosure was discovered through the testimony transcript review program. The review committee raised concerns that the Crime Scene Investigator (CSI) may have testified outside the scope of his expertise. The transcript was subsequently reviewed by the Quality Direction, section management, and HFSC's Legal Counsel. It was determined that

the CSI had testified beyond the scope of his expertise in this case by answering questions regarding footwear comparison without informing the jury that he was testifying as a lay person. Refer to corrective action report 2019-073 for more information. The TFSC did not take any further action.

2019 Management review self-disclosure updates

Last year two self-disclosures were filed with TFSC involving the Firearms and Toxicology sections that were closed as no further action needed.

- Disclosure TFSC 19.38 involved two nonconformances regarding the National Integrated Ballistic Information Network (NIBIN) process. A lead notification report incorrectly linked fired evidence from two separate cases. While researching the cases involved in that nonconformance, it was discovered that another examiner had imaged a cartridge case in the database under an incorrect case number. A comprehensive audit was completed for this process with the primary focus of determining an error rate for incorrect NIBIN uploads prior to the review process changes implemented as a result of these nonconformances. These nonconformances were reported to the Quality Division in 2018 but were disclosed in 2019 once the audit was completed. Refer to corrective action report 2018-057 and 2018-082 for more information.
- Disclosure TFSC 19.39 involved a Toxicology report that was released in 2015 with an incorrect blood alcohol concentration result due to a typographical error. This was discovered in 2019 while researching and collecting data for a manuscript. As a result of this nonconformance, an audit was completed by the Quality Division to determine if there were other instances were blood alcohol results were transcribed incorrectly to the report. Refer to corrective action report 2019-062 for more information.

See the TFSC website at https://txcourts.gov/ for more details.

Effectiveness of Implemented Improvements

During this management review period two LSS projects were facilitated: the Technical Review-Administrative Review (TR-AR) project and the Quality Score project.

The TR-AR project is focused on improving the technical and administrative review process across all technical sections by implementing process improvements, then evaluating their effectiveness. The project team organized a company-wide post-mortem review for case records completed in August and September 2019 to help establish a baseline defect metric. A second company-wide post-mortem review is currently underway to evaluate the effectiveness of improvements introduced during the project. One of the project team's recommendations will be for sections to incorporate post-mortem reviews into their workflows on an on-going basis. Improvements to the review process include developing a method for tracking defects in JusticeTrax, creating a review dashboard to display and track defects, purchasing grammar software, and providing technical review refresher training.

The Quality Score project sought to design an actionable metric to measure quality. The quality score measures sectional data from three independent categories: compliance, preventive and professional development. The compliance category includes a measure of incident and corrective action turnaround times, amended reports, defects from the review process and defect free cases; the preventive category includes a measure of preventive actions, LSS participation events and quality awareness events; and the professional development category includes monthly one-on-ones, continuing education and community outreach events. These measures will be used to drive preventive quality behaviors and

incentivize quality initiatives company-wide. For example, discussions with staff regarding nonconformances and/or standard operating procedure review/revision will be documented using the quality awareness workflow and incorporated into the section's overall quality score. The quality score will be multi-generational with future versions incorporating customer feedback, post-mortem review data and defects per opportunity data.

2019 Management Review Recommendations for Improvement Updates

The following are updates on recommendations from last year's management review that were not completed during this timeframe.

2019.4 The Quality Division has not yet provided training to staff on how to utilize the IR/CAR reporting workflow. A presentation was developed but needs to be formatted as a virtual presentation. Quality plans on presenting this training to staff in 2021.

2019.5 HFSC collaboration with HCDAO and HCPDO to offer training regarding HFSC's forensic services including information specific to technical sections was postponed due to the pandemic. A portion of this training was scheduled to take place during the management review period and has yet to be rescheduled.

The Quality Division provided resources to management to assist in courtroom testimony training. This included a video that focused on the limitations of expert courtroom testimony, redacted transcripts and a summary of common court questions specific to each section.

2020 Management Review Recommendations for Improvement

Overall, the management system was found to be suitable and effective in meeting the needs and mission of HFSC. However, there are opportunities to continuously improve our current management system. The following are recommendations for continuous improvement:

2020.1 Based on this year's analysis of categories of nonconformances, the majority of these were determined to be attributed to failure to follow sectional procedures. The Quality Division will expand the "Failure to Follow Policy" category for nonconformances into three separate categories: "Failure to Follow SOP", "Failure to Follow QM" and "Failure to Follow Policy". This category expansion will allow Quality to further investigate the process and workflow weaknesses that pose the highest risk to the work product.

2020.2 Provide a centralized training location for employees to access quality-related training materials such as testimony training, TFSC presentation, CE training, and annual ethics training.

2020.3 To provide a more effective and complete analysis of quality related data the Management review will transition to focus on a calendar year (January-December). The Quality Division will research and ultimately be responsible for executing the best course for this transition.

2020.4 The TR-AR LSS team should provide documentation of improvements to the review process. This documentation shall be communicated to our stakeholders and reference any applicable quality reports in which the project was cited.