



UNIVERSITI  
TEKNOLOGI  
PETRONAS

# STUDENT INDUSTRIAL INTERNSHIP PROGRAMME LOGBOOK

<b>Student Name:</b>	<b>Shahidan bin Idris</b>
<b>Matric No:</b>	<b>25204</b>
<b>Programme:</b>	<b>EE</b>
<b>Place of Training:</b>	<b>Intel Products (M) Sdn Bhd</b>
<b>Period of Training:</b>	<b>1 June 2020 – 18 December 2020</b>
<b>Project Title:</b>	<b>Data Collection Scripts and Contact Resistance (CRES)/Spring Rate Measurement Tool For In-Circuit Tester (ICT) Fixture Probe Health Maintenance And Life Extension</b>

## **SIP COURSE OUTLINE**

Subject Name	<b>Student Industrial Project</b>		
Code	<b>IBB/ICB3047</b>		
Subject Status	Major		
Level	SarjanaMuda / Bachelor		
Credit Value	7		
Prerequisite	Pass IBB/ICB3037		
Assessment	Graded Assessment - Technical Report, Log Book and Presentation		
Item	Percentage (%)		
	Host Company Supervisor	UTP Examiner	
Technical Project Report	-	50	
Log Book	20	-	
Presentation	10	20	
Total	30	70	
Lecturer	Professionals from the industry and UTP lecturers		
Semester Taught	Engineering and Petroleum Geosciences - After completion of semester 6 ICT/BIS - After completion of semester 4		
Course Learning Outcomes	<b>At the end of this course, students should be able to:</b> <ol style="list-style-type: none"> <li>1. Investigate the application of theoretical knowledge in the industry (C5)</li> <li>2. Analyse complex engineering/technical projects or problems (C4)</li> <li>3. Evaluate and propose solutions for given complex projects or problems (C6)</li> <li>4. Communicate effectively on complex engineering/technical activities (P4)</li> </ol>		
Subject Synopsis	<ul style="list-style-type: none"> <li>The Student Industrial Project provides opportunity to the students to integrate complex engineering/technologytheories with the real working environment.</li> <li>The students will demonstrate skills in work ethics, communication, management and working in a team.</li> </ul>		
Subject Planning	<p>The Student Industrial Project may comprise the following components but not limited to:</p> <ul style="list-style-type: none"> <li>Integration of theory with practice</li> <li>Real or simulation complex project-based assignments</li> <li>Research-based activities</li> <li>Methodology</li> <li>Data gathering and information collection</li> <li>Technical report</li> </ul>	<b>Duration</b>  <b>14 weeks</b>	
Reference	<ol style="list-style-type: none"> <li>1. Student Industrial Project Guidelines for Academic Supervisors, Host Company and Students, UniversitiTeknologi PETRONAS.</li> <li>2. Engineering Codes, Manuals and Standards</li> <li>3. Information Technology Standards and Guidelines</li> <li>4. Host Company's policy and guidelines</li> <li>5. Journal on appropriate topics</li> <li>6. Related engineering and technology books</li> <li>7. Internet resources</li> </ol>		
	Main Reference		

# **SIP TRAINING SCHEDULE**



## **SECTION A: SIP TRAINING SCHEDULE**

**Student's Name:** Shahidan bin Idris

**Student no:** 25204

**Programme:** EE

**Place of Training :** Intel Products (M) Sdn Bhd

**Period of Training:** 14 September – 18 December 2020

Department	Training activities	Week No/ Date												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Test Engineering	SPEED/ILM	14/9												
Assembly Test Manufacturing	Ergo in MFG Lab Warehouses and CS Facilities		23/9											
Company-wide	COVID-19 Pandemic Training			5/10										
Assembly Test Manufacturing	Hazardous Waste Handling and Storage				13/10									
Assembly Test Manufacturing	Pre-task Planning (PTP) and Safe Plan of Action (SPA)							2/11						
Assembly Test Manufacturing	Electrical Safety Module One Concepts and Procedures							2/11						

(Please return this form to SIIU within three weeks after student's registration)

(Make copies if necessary)

**Host Company Supervisor Signature &stamp:**

MR. INTEL PRODUCT (M) SDN. BHD. (365735-X)  
Lot 8, Jalan Hi-Tech 2/3  
Kulim Hi-Tech Park  
09090 Kulim Kedah, Malaysia

**Name:** Goh Fong Hsia

**Designation:** Test Manager

**Date:** 18 December 2020

# **SIP SUMMARY OF WEEKLY ACTIVITIES**

## **SIP SUMMARY OF WEEKLY ACTIVITIES**

<b>WEEK</b>	<b>BRIEF DESCRIPTION OF DAILY ACTIVITIES</b>
<b>1 - 2</b>	<ul style="list-style-type: none"> <li>• Troubleshoot no defect found (NDF) case for one of the new products in the factory</li> <li>• Update test program for new build version of one of the factory's products</li> <li>• Train intern regarding the Product Data Management System (PMDS) used in the factory to handle product excursions</li> </ul>
<b>3 - 4</b>	<ul style="list-style-type: none"> <li>• Troubleshoot and run SQL PathFinder script for Weekly ICT yield</li> <li>• Check products if component locations have probe contact within the fixture to ensure ICT tests on locations that have components only (prevent NDF occurrence)</li> <li>• Find solution to difficulty of checking software probe cycle count of all fixtures running in the factory</li> <li>• Explore and research possible parameters to be measured for probe health</li> <li>• Design CRES/Spring Rate Measurement Device mechanism and circuit configuration</li> </ul>
<b>5 - 6</b>	<ul style="list-style-type: none"> <li>• Present and deliver first designs and plans for CRES/Spring Rate Measurement Device</li> <li>• Develop tool to collect software probe cycle counts from all fixtures used in the factory</li> <li>• Explore alternatives for executing/completing web-based system for ICT Fixture PM Report Generation Tool and Probe Replacement Tracking System</li> </ul>
<b>7 - 8</b>	<ul style="list-style-type: none"> <li>• Receive proposal and quotation from vendor on CRES/Spring Rate Measurement Device</li> <li>• Investigate and find for possible tools that can be consigned from factory for vendor to develop CRES/Spring Rate Measurement Device</li> <li>• Make request for network drive from IT team for ICT Fixture PM Report Generation Tool</li> </ul>
<b>9 - 10</b>	<ul style="list-style-type: none"> <li>• Complete development of ICT Fixture PM Report Generation Tool scripts/tools</li> <li>• Test and validate software probe cycle count harvesting script for usage on tester PC data</li> </ul>
<b>11 - 12</b>	<ul style="list-style-type: none"> <li>• Build and study ROI for purchasing/beginning development of CRES/Spring Rate Measurement Device</li> <li>• Test and validate ICT Fixture PM Report Generation Tool within network drive</li> <li>• Enable Process Capability (Cpk) Calculation for factory's new products through developed scripts</li> <li>• Investigate abnormal high NDF cases and process performance for selected products running in factory</li> </ul>
<b>13 - 14</b>	<ul style="list-style-type: none"> <li>• Complete development of Probe Replacement Tracking System</li> <li>• Test and validate probe replacement tracking tool for usage on tester PC data</li> </ul>

**SIP SUMMARY OF  
WEEKLY REPORT  
SCORES (LOG BOOK)  
FORM**

**SIP SUMMARY OF WEEKLY REPORT SCORES (LOG BOOK) FORM**Student's Name: Shahidan bin Idris      Student no: 25204      Programme: EEPlace of Training: Intel Products (M) Sdn Bhd      Period of Training: 14/9/20 -18/12/20

WEEK	SCORE
<b>1 - 2</b>	20/20
<b>3 - 4</b>	20/20
<b>5 - 6</b>	20/20
<b>7 - 8</b>	20/20
<b>9 – 10</b>	20/20
<b>11 - 12</b>	20/20
<b>13 - 14</b>	20/20
<b>TOTAL SCORE</b>	<b>140/140</b>
<b>FINAL SCORE = <math>\frac{\text{TOTAL SCORE}}{140} \times 100</math></b>	<b>100/100</b>

**KINDLY SUBMIT THIS FORM WITH SCORES (\*to the completed weeks) TO THE UTP SUPERVISOR DURING THE INTERNSHIP PRESENTATION** B/P: Intel Product (M) Sdn. Bhd. (365735-X)

Lot 8, Jalan Hi-Tech 2/3

Kulim Hi-Tech Park  
09090 Kulim Kedah, Malaysia

Host Company Supervisor's Signature &amp; stamp:

Name: Goh Fong Hsia

Designation: Test Manager

Host Company's name: Intel Products (M) Sdn Bhd

Date: 18/12/2020

\*Note : The remaining scores of any outstanding weeks will be filled up by UTP Supervisor upon the student submission of complete log book at UTP

# **SIP LOGBOOK REPORT**

**LOG BOOK****WEEK NO: 1-2**

WEEK NO	DATE	BRIEF DESCRIPTION OF DAILY ACTIVITIES
1-2	14/9 – 25/9	<ul style="list-style-type: none"> <li>• Troubleshoot no defect found (NDF) case for one of the new products in the factory</li> <li>• Update test program for new build version of one of the factory's products</li> <li>• Train intern regarding the Product Data Management System (PMDS) used in the factory to handle product excursions</li> </ul>

**Logbook Weekly Evaluation by HOST COMPANY SUPERVISOR****Instruction to Host Company Supervisor**

Please refer to the student's to assess his/her performance.  
Please award the scores based on the range below:

Student's Score	Beginning (<2.0)	Developing (2.0 to <3.25)	Accomplished (Rare) (3.25 to <4.0)	Exemplary (Exceptionally Rare) (4.0 to 5.0)	Score
Initiative & Creativity	Had little observable drive and did not have new ideas	Some observable drive and some new ideas	Mostly self-starter and sometimes sought new challenges and offered new ideas	Always a self-starter and consistently sought new challenge and offered new creative ideas	5/5
Task Accomplishment & Commitment	Partially accomplished given task despite full supervision	Accomplished given task but with full supervision	Accomplished given task but with some supervision	Accomplished given task with very minimum supervision	5/5
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Attitude & Self Control	Unable to demonstrate positive attitude and hardly maintained self-control under pressure	Occasionally demonstrated positive attitude and occasionally maintained self-control under pressure	Sometimes demonstrated positive attitude and maintained self-control under pressure	Consistently demonstrated positive attitude and consistently maintained self-control under pressure	5/5
Total Score					20/20

**Comments:**

B/P: Intel Product (M) Sdn. Bhd. (365735-X)

**Host Company Supervisor's Signature & stamp:**

Lot 8, Jalan Hi-Tech 2/3

Kulim Hi-Tech Park

09090 Kulim Kedah, Malaysia

**Name & Designation:** Goh Fong Hsia, Test Manager**Date:** 25 September 2020

(make copies if necessary)

**Objective(s) of the activities :**

Troubleshoot no defect found (NDF) case for one of the new products in the factory

**Contents :****Action(s)**

- Identified the failure that is being called by the ICT machine on the product
- Since failure is 'power check' failure, ran basic tests to check if there is power-related issue. Ran pin test, short test, and analog test on board
- Open test program to check 'power check' test. Cross check with folder contents (components) and test order
- Changed delay in test program for failed nodes
- Run macro test ('power check' alone) after troubleshooting
- Run full test

**Result(s)**

- Short test and analog test passed. This means no component-related issue causing 'power check' failure
- Test program matches with components in 'power check' folder, matches with test order. This means components and nodes that are intended to be tested for 'power check' are tested (no missing or excess nodes tested)
- Test passed after delay increased in test program for failed nodes. Board has more time to discharge from previous test before enter 'power check' test, causing test pass

## **DETAIL REPORT**

**WEEK NO: 1-2**

### **Objective(s) of the activities :**

Update test program for new build version of one of the factory's products

### **Contents :**

#### **Action(s)**

- In product folder in tester PC, add new folder for new build version
- Open SAP, check for component measurement range changes
- Open test program
  - Add new row for option to test with latest build
  - Check if test program has any more of old build tests, check especially for BLT programming
  - Check component measurement range changes one-by-one. Identify if they are base tests or there is reference to other test folder (e.g., analog test within product folder)
- Open test order
  - Look for old build
  - Copy paste test lines
  - Change newly pasted test lines with new build
- Open old build analog folder
  - Find changing components in analog folder
  - Copy and paste into new build analog folder
- Open component files, change test values according to SAP-ME
  - Compile test program. Make sure no syntax errors
- Repeat for all component files to compile all

#### **Result(s)**

- Components with measurement range updates for new build are updated in test program
- Test program was compiled without syntax errors
- Validation to be done on gold boards (confirmed healthy boards) to check if test program updates work correctly

## **DETAIL REPORT**

**WEEK NO: 1-2**

### **Objective(s) of the activities :**

Train intern regarding the Product Data Management System (PMDS) used in the factory to handle product excursions

### **Contents :**

#### **Action(s)**

- Completed web-based training on SPEED/ILM
- Completed final quiz relating to the SPEED/ILM course

#### **Result(s)**

- Understood the function of the Product Data Management System (PMDS) software used to handle Excursion Management applications
- Understood what events are under the Quality Event Form (QEF)
- Understood the 9 sections that make up the QEF
- Understood the BKM's for QEF entries
- Understood what qualifies for QER, DRB, and MRB

**LOG BOOK****WEEK NO: 3-4**

WEEK NO	DATE	BRIEF DESCRIPTION OF DAILY ACTIVITIES
3-4	28/9 – 9/10	<ul style="list-style-type: none"> <li>• Troubleshoot and run SQL PathFinder script for Weekly ICT yield</li> <li>• Check products if component locations have probe contact within the fixture to ensure ICT tests on locations that have components only (prevent NDF occurrence)</li> <li>• Find solution to difficulty of checking software probe cycle count of all fixtures running in the factory</li> <li>• Explore and research possible parameters to be measured for probe health</li> <li>• Design CRES/Spring Rate Measurement Device mechanism and circuit configuration</li> </ul>

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Total Score					20/20

**Comments: He able to understand and aligned project expectation and given him opportunity to plan on task execution schedule.**

B/P: Intel Product (M) Sdn. Bhd. (365735-X)

**Host Company Supervisor's Signature & stamp:**

Lot 8, Jalan Hi-Tech 2/3

Kulim Hi-Tech Park

09090 Kulim Kedah, Malaysia

**Name & Designation: Goh Fong Hsia, Test Manager**

**Date: 9 October 2020**

(make copies if necessary)

**Objective(s) of the activities :**

Troubleshoot and run SQL PathFinder script for Weekly ICT yield

**Contents :****Action(s)**

- Work buddy has created SQL PathFinder script in the past to query Weekly ICT product yield
  - Data includes product name, percentage of test pass, percentage of true failures, NDF rate, etc
- Intern tasked to troubleshoot script to run consistently (script is programmed to run every day, however only appears every 2 or 3 days)
- Studied the script and traced the execution path (traced each macro)
- Identified error is in new name of raw data file that is not detected by script, thus failing the email function
- Changed script to detect new name of raw data file
- Deleted old email recipients (employees who are not in ICT), added intern and work buddy as email recipients for the script
- Set script to run starting 6.00am every day, in order for query to complete and email sent by 8.00am each day

**Result(s)**

- Script is able to run consistently to yield ICT product yield data
- Email is received by work buddy and intern for the purpose of analyzing ICT test performance
- Data relating to test performance, especially on NDF rate, can be easily referred to every day
- Intern can use raw data file sent through email to investigate abnormal test performance issues in boards (high NDF cases) to report to work buddy and HCSV

**Objective(s) of the activities :**

Check products if component locations have probe contact within the fixture to ensure ICT tests on locations that have components only (prevent NDF occurrence)

**Contents :****Action(s)**

- Opened schematic file of the product
- Open SPEED (Product Data Management System) to check for locations that are empty on the product
- From empty locations on SPEED, find these locations on the product schematic
- From the locations drawn on the schematic, look for the fixture for that product, check if the fixture has a hole at that location (indicating the fixture probe passes through the hole and tests the product at that location)
- It should be expected that there is no hole on these empty locations (no component so no need for ICT to test at that point). If there are holes at the location, report back to work buddy

**Result(s)**

- Some of the component locations identified to be empty have holes in the fixture, meaning fixture will conduct tests on those points
- Locations that have holes, but empty components, are reported back, to prevent ICT from testing on these locations and causing NDF

**Objective(s) of the activities :**

Find solution to difficulty of checking software probe cycle count of all fixtures running in the factory

**Contents :****Action(s)**

- Analysed the current condition of checking software probe cycle counts of fixtures in the factory
  - Cycle count recorded by test program and written in counter files
  - Counter files located in individual product folders in tester PC (majority of fixtures and older products)
  - Newer products and fixtures have the counter files located on the home directory of tester PC in a 'Counter' folder
  - Engineer or technician needs to open each file one-by-one to retrieve probe cycle count
- Look at viability of developing solution to solve problem. Analysed what are the benefits that can be obtained from developing a solution for the problem
  - Engineer and technician can easily extract all software probe cycle count from fixtures
  - Displaying the data in a table or dashboard helps provide a one-stop centre for checking probe cycle counts
  - If record software probe cycle count in fixed time intervals (e.g., monthly), can study probe usage in relation to volume of boards ran on fixture

**Result(s)**

- Solution to be developed to gather probe cycle counts from all fixtures in tester PC into a single dashboard
- Dashboard should display probe cycle count of each fixture. Each column indicates the date that the probe cycle counts are harvested
- To investigate further on tools and approach to accomplish the task

**Objective(s) of the activities :**

Explore and research possible parameters to be measured for probe health

**Contents :****Action(s)**

- Searched online for measurement of ICT fixture probe health
- Referred to other organisations/institutions on how they conduct probe life cycle test
- Investigate what tools and circuit configurations are used to measure the parameters

**Result(s)**

- Identified the parameters that are measured by other companies
  - Contact Resistance (CRES)
  - Spring Rate (Spring Force divided by Spring Travel)
- Identified the tools and circuit configurations needed to measure the parameters
  - Spring Force → Electronic Load Cell – Strain Gauge (force sensor) with Wheatstone Bridge Configuration
  - Spring Travel (displacement) → Linear Variable Differential Transformer (LVDT)
  - Contact Resistance (CRES) → 4-wire Kelvin measurement
- To proceed with designing tool and measurement mechanism

**Objective(s) of the activities :**

Design CRES/Spring Rate Measurement Device mechanism and circuit configuration

**Contents :****Action(s)**

- Designed the mechanism of measuring Spring Force and Spring Travel of ICT fixture probe
- Designed the circuit configuration of CRES measurement on ICT fixture probe
- Present designs to work buddy and HCSV to obtain feedback

**Result(s)**

- Mechanism to measure Spring Force and Spring Travel is developed based on tools decided previously
- Load will apply force onto ICT fixture probe to cause reactive force (spring force), which is sensed by the electronic load cell
- Spring travel from compression to release of ICT fixture probe measured using LVDT
- Circuit configuration to measure CRES is based on 4-wire Kelvin measurement
- Current is pumped through ICT fixture probe and the voltage across the probe is measured using a voltmeter. CRES is obtained from dividing voltage drop with current across the circuit

**LOG BOOK****WEEK NO: 5-6**

WEEK NO	DATE	BRIEF DESCRIPTION OF DAILY ACTIVITIES
5-6	12/10 – 23/10	<ul style="list-style-type: none"> <li>Present and deliver first designs and plans for CRES/Spring Rate Measurement Device</li> <li>Develop tool to collect software probe cycle counts from all fixtures used in the factory</li> <li>Explore alternatives for executing/completing web-based system for ICT Fixture PM Report Generation Tool and Probe Replacement Tracking System</li> </ul>

Logbook Weekly Evaluation by HOST COMPANY SUPERVISOR					
<b>Instruction to Host Company Supervisor</b> Please refer to the student's to assess his/her performance. Please award the scores based on the range below:					
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Total Score					20/20
<b>Comments:</b>					
B/P: Intel Product (M) Sdn. Bhd. (365735-X)					
Host Company Supervisor's Signature & stamp:					
Lot 8, Jalan Hi-Tech 2/3 Kulim Hi-Tech Park 09090 Kulim Kedah, Malaysia					
Name & Designation: Goh Fong Hsia, Test Manager					
Date: 23 October 2020					
(make copies if necessary)					

## **DETAIL REPORT**

**WEEK NO: 5-6**

### **Objective(s) of the activities :**

Present and deliver first designs and plans for CRES/Spring Rate Measurement Device

### **Contents :**

#### **Action(s)**

- Meet with vendor representative at the factory to present initial designs of CRES/Spring Rate Measurement Device
- Get feedback on capabilities and past experience of vendor accomplish similar task/project
- Present expected deliverables for the project and seek for quotation for the device
- Vendor requested for additional information required for quotation and project designs

#### **Result(s)**

- Vendor understands the intended capability to be enabled at the factory for measurement of CRES/Spring Rate of ICT Fixture Probes
- Vendor received first designs on potential mechanism that is intended to conduct measurement
- Vendor and project team to communicate and confirm on scope of work (SOW), including range of measurements, list of fixture probes used at the factory to be measured (specifications)
- Vendor to present designs and provide quotations on the project

**Objective(s) of the activities :**

Develop tool to collect software probe cycle counts from all fixtures used in the factory

**Contents :****Action(s)**

- Explored the possibility of using Python and pandas to harvest the counter files
- Developed Python script to be run using Spyder IDE which is installed on tester PC
- Conduct initial tests on localhost by copying sample counter files into localhost and running script
- Convert Python script to executable file (.exe file) using Pyinstaller

**Result(s)**

- Script is developed to collect all software probe cycle count from fixtures
- Script looks in Counter folder and individual product folders in tester PC to find counter files
- Script opens counter file and extracts integer value of probe cycle count
- Script collects value into a pandas DataFrame
- Script displays the data into a table in the form of HTML file
- Initially, script is programmed to run using Spyder IDE. Script is later converted into an executable file (.exe file) to enable easier script running

## **DETAIL REPORT**

**WEEK NO: 5-6**

### **Objective(s) of the activities :**

Explore alternatives for executing/completing web-based system for ICT Fixture PM Report Generation Tool and Probe Replacement Tracking System

### **Contents :**

#### **Action(s)**

- Scheduled and attended meeting with IT team representative, along with manager from Functional Test to discuss on alternative solutions
- IT team representative provided 3 options on moving forward to project, which is classified as important but not critical:
  - Self-develop the web system, as the representative from Functional Test is unable to commit to new project while working on other tasks
  - Request IT service to develop on behalf
  - Go for scripting/macro-based development, while relying on network drive to enable collaborative work
- Intern to decide on which option to choose for executing the project

#### **Result(s)**

- Intern decided on adopting scripting/macro-based development, with network drive for collaborative work
- Intern to prepare list of user privilege levels, teams that will be given read/write access to network drive
- Intern to plan and decide on size of network drive to be allocated for project
- Intern to make request for network drive from IT team with the planned details (users, size)

**LOG BOOK****WEEK NO: 7-8**

WEEK NO	DATE	BRIEF DESCRIPTION OF DAILY ACTIVITIES
7-8	26/10 – 6/11	<ul style="list-style-type: none"> <li>• Receive proposal and quotation from vendor on CRES/Spring Rate Measurement Device</li> <li>• Investigate and find for possible tools that can be consigned from factory for vendor to develop CRES/Spring Rate Measurement Device</li> <li>• Make request for network drive from IT team for ICT Fixture PM Report Generation Tool</li> </ul>

Logbook Weekly Evaluation by HOST COMPANY SUPERVISOR					
<b>Instruction to Host Company Supervisor</b> Please refer to the student's to assess his/her performance. Please award the scores based on the range below:					
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Total Score					20/20
<b>Comments:</b> <i>B/P: Intel Product (M) Sdn. Bhd. (365735-X) Lot 8, Jalan Hi-Tech 2/3 Kulim Hi-Tech Park 09090 Kulim Kedah, Malaysia</i>					
<b>Name &amp; Designation:</b> Goh Fong Hsia, Test Manager					
<b>Date:</b> 6 November 2020					
<i>(make copies if necessary)</i>					

## **DETAIL REPORT**

**WEEK NO: 7-8**

### **Objective(s) of the activities :**

Receive proposal and quotation from vendor on CRES/Spring Rate Measurement Device

### **Contents :**

#### **Action(s)**

- Met with representatives from vendor team for presentation of proposed designs and quotation from vendor
- Vendor presented designs based on provided information and scope of work (SOW)
- Vendor provided optional features and additions to the device to help in measurement and ease-of-use
- Vendor provided quotation and time-to-lead for the overall device
- Project team requested for itemization of quotation to help in ROI study

#### **Result(s)**

- Project team received proposed designs from vendor
- Project team provided feedback on designs and enquired regarding details of the design
- Quotation to be revised according to selection of features and tools from project team
- Quotation to be itemized as requested by project team

## **DETAIL REPORT**

**WEEK NO: 7-8**

### **Objective(s) of the activities :**

Investigate and find for possible tools that can be consigned from factory for vendor to develop CRES/Spring Rate Measurement Device

### **Contents :**

#### **Action(s)**

- Project team analysed tools and equipment used to develop CRES/Spring Rate Measurement Device by vendor
- Intern investigated factory and communicated with teams to find for digital multimeter (DMM) to be used as source measure unit (SMU) for device (to consign to vendor)
- Intern sought help from Functional Test team to obtain spare Desktop PC for running CRES/Spring Rate Automation software
- Intern explored alternatives in measuring CRES and Spring Rate, such as direct measurement using DMM through 4-wire Kelvin Measurement

#### **Result(s)**

- DMM to be consigned to vendor to develop measurement device
- DMM will not be purchased separately from vendor, thus quotation price is reduced
- Desktop PC is to be provided from factory for vendor to develop device. Vendor service is requested to install operating system (Windows 10) into desktop PC. Quotation price is reduced

## **DETAIL REPORT**

**WEEK NO: 7-8**

### **Objective(s) of the activities :**

Make request for network drive from IT team for ICT Fixture PM Report Generation Tool

### **Contents :**

#### **Action(s)**

- Intern planned and confirmed on user privilege levels and size of network drive needed for project
- Intern emailed IT team representative to request for network drive for the project

#### **Result(s)**

- Network drive is created for the project, with the allocated size and name set by intern
- Intern and work buddy given admin privileges, PM crew given read/write access, while Parametric Test team given read access
- Intern to begin development of scripts/tools for ICT Fixture PM Report Generation Tool within network drive

**LOG BOOK****WEEK NO: 9-10**

WEEK NO	DATE	BRIEF DESCRIPTION OF DAILY ACTIVITIES
9-10	9/11 – 20/11	<ul style="list-style-type: none"> <li>• Complete development of ICT Fixture PM Report Generation Tool scripts/tools</li> <li>• Test and validate software probe cycle count harvesting script for usage on tester PC data</li> </ul>

Logbook Weekly Evaluation by HOST COMPANY SUPERVISOR								
<b>Instruction to Host Company Supervisor</b> Please refer to the student's to assess his/her performance. Please award the scores based on the range below:								
Student's Score	Beginning (<2.0)	Developing (2.0 to <3.25)	Accomplished (Rare) (3.25 to <4.0)	Exemplary (Exceptionally Rare) (4.0 to 5.0)	Score			
Initiative & Creativity	Had little observable drive and did not have new ideas	Some observable drive and some new ideas	Mostly self-starter and sometimes sought new challenges and offered new ideas	Always a self-starter and consistently sought new challenge and offered new creative ideas	5/5			
Task Accomplishment & Commitment	Partially accomplished given task despite full supervision	Accomplished given task but with full supervision	Accomplished given task but with some supervision	Accomplished given task with very minimum supervision	5/5			
Attendance & Punctuality	Frequently absent and always late	Sometimes absent and sometimes late	Never absent and almost always on time	Never absent and always on time	5/5			
Attitude & Self Control	Unable to demonstrate positive attitude and hardly maintained self-control under pressure	Occasionally demonstrated positive attitude and occasionally maintained self-control under pressure	Sometimes demonstrated positive attitude and maintained self-control under pressure	Consistently demonstrated positive attitude and consistently maintained self-control under pressure	5/5			
Total Score					20/20			
<b>Comments:</b>								
B/P: Intel Product (M) Sdn. Bhd. (365735-X)								
<b>Host Company Supervisor's Signature &amp; stamp:</b>		Lot 8, Jalan Hi-Tech 2/3 Kulim Hi-Tech Park 09090 Kulim Kedah, Malaysia						
<b>Name &amp; Designation:</b> Goh Fong Hsia, Test Manager								
<b>Date:</b> 20 November 2020								
(make copies if necessary)								

## **DETAIL REPORT**

**WEEK NO: 9-10**

### **Objective(s) of the activities :**

Complete development of ICT Fixture PM Report Generation Tool scripts/tools

### **Contents :**

#### **Action(s)**

- Intern developed scripts/tools using Python
- Tool makes use of pandas for data handling of PM crew input to generate reports
- Addition of GUI using PySimpleGUI for uploading photos for report (showing before and after conducting PM activity)
- Tool developed to read PM activity steps (as per spec document) from Excel file
- Tool developed to extract hardware probe cycle count from reports into separate CSV file
- Intern tested tool within localhost by generating own reports using tool
- Intern converted completed script into executable file (.exe file) using PyInstaller

#### **Result(s)**

- Tool is produced to allow PM crew to quickly and easily generate Fixture PM Report
- Module Engineer can easily edit PM Report steps when changes in spec documents occur (by editing Excel File)
- Hardware probe cycle count is collected by the tool and dashboard is shown of top probe cycle counts to remind PM crew to conduct Level 2 PM Activity (reprobing)
- Tool is able to be executed within network drive without the need of installing additional software (Python installation or Spyder IDE)

**Objective(s) of the activities :**

Test and validate software probe cycle count harvesting script for usage on tester PC data

**Contents :****Action(s)**

- Final major debugging and development done by intern on software probe cycle count harvesting script
- Executable file (.exe file) generated and deployed to tester PC drive through Remote Desktop Connection
- File is executed to harvest all software probe cycle counts from fixtures running in the factory
- Values (probe cycle counts) gathered are cross-checked with randomly selected counter files in 'Counter' folder and individual product folders
- Continue running script on regular intervals (monthly)

**Result(s)**

- Software probe cycle count from all fixtures is collected into a single dashboard
- Users are able to have one-glance to see all probe cycle counts of fixtures running in the factory
- Engineers/technicians can observe which fixtures are having high probe cycle count (above 20k and 40k) from the dashboard
- Users can do trend analysis of probe usage, using the probe cycle count data in fixed time intervals with data on volume of boards ran on fixtures.

**LOG BOOK****WEEK NO: 11-12**

WEEK NO	DATE	BRIEF DESCRIPTION OF DAILY ACTIVITIES
11-12	23/11 – 4/12	<ul style="list-style-type: none"> <li>• Build and study ROI for purchasing/beginning development of CRES/Spring Rate Measurement Device</li> <li>• Test and validate ICT Fixture PM Report Generation Tool within network drive</li> <li>• Enable Process Capability (Cpk) Calculation for factory's new products through developed scripts</li> <li>• Investigate abnormal high NDF cases and process performance for selected products running in factory</li> </ul>

Logbook Weekly Evaluation by HOST COMPANY SUPERVISOR					
<b>Instruction to Host Company Supervisor</b> Please refer to the student's to assess his/her performance. Please award the scores based on the range below:					
Student's Score	Beginning (<2.0)	Developing (2.0 to <3.25)	Accomplished (Rare) (3.25 to <4.0)	Exemplary (Exceptionally Rare) (4.0 to 5.0)	Score
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Task Accomplishment & Commitment	Partially accomplished given task despite full supervision	Accomplished given task but with full supervision	Accomplished given task but with some supervision	Accomplished given task with very minimum supervision	5/5
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Total Score					20/20
<b>Comments:</b>					
B/P: Intel Product (M) Sdn. Bhd. (365735-X)					
<b>Host Company Supervisor's Signature &amp; stamp:</b>					
Lot 8, Jalan Hi-Tech 2/3 Kulim Hi-Tech Park 09090 Kulim Kedah, Malaysia					
<b>Name &amp; Designation:</b> Goh Fong Hsia, Test Manager					
<b>Date:</b> 4 December 2020					
(make copies if necessary)					

**Objective(s) of the activities :**

Build and study ROI for purchasing/beginning development of CRES/Spring Rate Measurement Device

**Contents :****Action(s)**

- Intern and work buddy met with HCSV to discuss on wayforward for CRES/Spring Rate Measurement Device
- Studied and analysed Return of Investment (ROI) for the device at the current moment
  - How much cost savings is provided if device/measurement capability enabled?
  - How frequent will device be used to measure fixture probes?
  - Will measurement of fixture probes help a lot in improving NDF cases for ICT?
- Intern produced RAPID Decision Making slides on the CRES/Spring Rate Measurement Device
- Intern developed A3 Template slides for the project
- Intern checked the contents of ROI slides (includes RAPID and A3) with work buddy and delivered to HCSV

**Result(s)**

- Project team understands the current situation (and POR for probe replacements) of ICT with regards to implementation of CRES/Spring Rate Measurement Device
- Project team understands the RAPID Decision Making and project details (through A3 template)
- ROI at current moment does not give motivation to purchase/develop CRES/Spring Rate Measurement Device, further studying and action needs to be taken on current probe replacement POR to find cost-savings from CRES/Spring Rate Measurement
- Budget allocation need to be analysed and provided before purchasing measurement device.

## **DETAIL REPORT**

**WEEK NO: 11-12**

### **Objective(s) of the activities :**

Test and validate ICT Fixture PM Report Generation Tool within network drive

### **Contents :**

#### **Action(s)**

- Intern conducts final bug fixing and development on ICT Fixture PM Report Generation Tool
- Intern generates executable file (.exe file) from tool
- Intern releases software in network drive created (requested earlier from IT team) via Remote Desktop Connection
- Intern runs tool within network drive to generate Fixture PM Report
- Intern demonstrates tool usage to work buddy and HCSV within network drive
- Documentation and tool usage instructions added within network drive for module engineer and PM crew reference
- PM crew tests and validates tool by generating their own Fixture PM Report

#### **Result(s)**

- Minor bug fixes to solve some exceptions and errors occurred
- Tool works as intended and produces correct results (report is generated according to PM crew input)
- Hardware probe cycle count is gathered from PM reports into separate CSV and Dashboard (HTML and PDF)
- Pareto Chart is produced showing top probe cycle count for fixtures
- Tool ready for production/factory setting usage

## **DETAIL REPORT**

**WEEK NO: 11-12**

### **Objective(s) of the activities :**

Enable Process Capability (Cpk) Calculation for factory's new products through developed scripts

### **Contents :**

#### **Action(s)**

- Communicated with Technology Development (TD) team representative who has the developed scripts to calculate Cpk for products
- TD rep requested assistance to run parser tool (converts error log file to CSV data) on selected new product log files
- TD rep taught intern how to use parser tool and run Cpk calculation tool on parsed CSV data
- Intern ran parser tool to generate CSV data for new boards and ran Cpk calculation tool to obtain process data for new boards
- Intern conducted analysis and sent data with report to work buddy and HCSV for new boards running at ICT

#### **Result(s)**

- CSV data generation from tester log file is enabled for ICT (to be validated further by TD and module engineer)
- Cpk calculation tool is enabled for ICT (for latest products) to study process performance of ICT on these products
- Intern can use Cpk calculation to investigate abnormality (unstable RefDes) when investigating high NDF cases

**Objective(s) of the activities :**

Investigate abnormal high NDF cases and process performance for selected products running in factory

**Contents :****Action(s)**

- Intern checked through Weekly ICT Yield data to identify products with unusually high NDF (normally low NDF, sudden high, or high-low trend)
- Intern collected error log files within 3 weeks interval for these products
- Intern ran CSV parser tool on error log files
- Intern ran Cpk calculation tool on CSV data to generate Cpk calculations
- Intern ran analysis on Cpk data (unstable RefDes over total RefDes)
- For unstable RefDes, intern cross-checked with error log files to identify if there is repeated test fails
- From SAP, intern looked for NDF cases involving the products called by process, checked error log files of the NDF cases
- Intern conducted analysis and gave hypothesis on NDF root cause based on failed test, trend of failure, and Cpk data results

**Result(s)**

- ICT able to understand possible root cause for high NDF for certain products
- ICT able to understand process performance of these products
- ICT understands the difference in process performance for different build versions of the product
- NDF cases to be monitored continuously and called out/investigated for abnormality by intern

**LOG BOOK****WEEK NO: 13-14**

WEEK NO	DATE	BRIEF DESCRIPTION OF DAILY ACTIVITIES
13-14	7/12 – 18/12	<ul style="list-style-type: none"> <li>• Complete development of Probe Replacement Tracking System</li> <li>• Test and validate probe replacement tracking tool for usage on tester PC data</li> </ul>

Logbook Weekly Evaluation by HOST COMPANY SUPERVISOR								
<b>Instruction to Host Company Supervisor</b> Please refer to the student's to assess his/her performance. Please award the scores based on the range below:								
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Attitude & Self Control	Unable to demonstrate positive attitude and hardly maintained self-control under pressure	Occasionally demonstrated positive attitude and occasionally maintained self-control under pressure	Sometimes demonstrated positive attitude and maintained self-control under pressure	Consistently demonstrated positive attitude and consistently maintained self-control under pressure	5/5			
Total Score					20/20			
<b>Comments:</b> Satisfied with his performance from idea alignment and project fine tuning up to deliver project outcome. He clear on the project expectation and flexible to fine tune per input given. Really appreciate of his flexibility and fearless for willing to try different thing. THANKS.								
<b>Host Company Supervisor's Signature &amp; stamp:</b>			<i>Lot 8, Jalan Hi-Tech 2/3 Kulim Hi-Tech Park 09090 Kulim Kedah, Malaysia</i>					
<b>Name &amp; Designation:</b> Goh Fong Hsia, Test Manager								
<b>Date:</b> 18 December 2020								

(make copies if necessary)

**Objective(s) of the activities :**

Complete development of Probe Replacement Tracking System

**Contents :****Action(s)**

- Intern developed to tool using Python
- Tool handles input data from user using pandas DataFrame
- Tool implements GUI window to allow input of Probe ID and Failure Mode by user
- Failure Mode is parsed from a text file, which is easily editable by module engineer in the case of new test capability added to ICT (new failure modes available)
- Using Fixture ID and Probe ID input by user, tool will refer to probe list of Fixture ID to find probe ID information
- Information obtained from probe list includes probe location, BRC#, part number, probe coordinate, net name, probe size
- Probe ID, Failure Mode, and probe information obtained from probe list is stored into CSV file to track probe replacement
- Bar chart is generated to show top probe IDs replaced and top failure modes causing replacements

**Result(s)**

- Probe replacements done during production to troubleshoot repeated failures/NDF can be tracked and recorded
- Retrieval of probe list information allows study of relationship between probes replaced, failure modes, and probe specifications (size, location, coordinates)
- Information obtained from probe replacement tracking tool helps in investigating root cause of probe failure, as well as study for probe lifespan

**Objective(s) of the activities :**

Test and validate probe replacement tracking tool for usage on tester PC data

**Contents :****Action(s)**

- Intern conducted final bug fixes and development
- Intern generated executable file (.exe file) from tool developed
- Intern released software in tester PC drive via Remote Desktop Connection
- Intern demonstrated tool usage to work buddy and HCSV in tester PC drive
- Intern produced documentation on tool usage for user reference
- Work buddy ran test and validation on tool using one of products in the factory

**Result(s)**

- Minor bug fixes on small exceptions and errors
- Probe replacements done during production can now be tracked better (with sufficient failure mode and probe information)
- Tool developed is adaptable to new fixtures and test capabilities. Probe list of new fixture to be added into folder, new failure modes to be added into failure mode list
- Root cause of probe failures can be investigated better with the gathered information using the tool

# **SIP PROCESS FLOW**

## PROCESS FLOW OF STUDENT INDUSTRIAL PROJECT (SIP)

