

AUTOMATED FACIAL RECOGNITION

STANDARD OPERATING PROCEDURES

Automated Facial Recognition

Standard Operating Procedures

v12



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1. Introduction

South Wales Police is leading UK policing in the deployment of Facial Recognition Software through Static and Mobile Solutions within the Force area.

There are two elements to the project:

AFR Locate: 'Live-time' deployment of AFR technology, which compares live camera feeds of faces against a predetermined watchlist in order to 'locate' persons of interest. This generates possible matches that are reviewed by the operator(s).

AFR Identify: 'Slow-time' application of AFR technology, comparing still images of unknown suspects and persons of interest, against a custody database of circa 500,000 people, and returning up to 200 results. These results are ranked based on the technology generating a 'similarity score' and are then reviewed by the operator, who decides whether a possible match is made and then return the information to the investigating officer.

2. Terminology

Throughout this document there are numerous terms that are specifically linked to the Automated Facial Recognition application:

Automated Facial Recognition (AFR) –

This technology works by analysing key facial features, generating a mathematical representation of these features, and then comparing them against the mathematical representation of known faces in a database generating possible matches. This is based on digital images (still or from live camera feeds)

Watchlist A Watchlist provides a mechanism for grouping Subjects.

Alert A notification triggered by the AFR Locate technology when a possible match is made. This alert is then displayed to the operator.

PTZ Camera Pan Tilt Zoom Camera is a camera that is capable of zooming, focussing and being turned around 360°.

Static Camera This is a fixed camera in a single location and is un-moveable by the Operator.

Dashboard An interactive and user configurable web interface providing at-a-glance information regarding the latest subjects matched and access to some of the configuration components of the product.

Role Users may be assigned to one or more Roles. A Role is a package of permissions that grant access to features of the AFR application.

Operator South Wales Police officer or staff member tasked with operating the AFR technology. Operators will not be able to see any saved Watch Lists unless an Alert is received.

Administrator A specially trained person who has access to other features of the Application.

Score When conducting comparisons, the AFR technology scores possible matches on their similarity.

Faces per frame

The number of faces that can be analysed by the technology per frame.

Correct alert (aka true positive)

A match suggested by the AFR technology that is deemed correct by the operators.

Incorrect alert (aka false positive)

A match suggested by the AFR technology that is deemed incorrect by the operator and/or intervention officer.

Incorrect alert rate (aka false positive rate)

The number of incorrect alerts within the total faces seen by the technology.

Frames per second

The number of frames that can be analysed by AFR technology per second.

Frames per second in addition to faces per frame equals the faces that can be seen by the technology per second.

Intervention team

Usually comprises two officers who are allocated to a single AFR Locate deployment location (a van). Operators can send intervention teams to stop individuals where they deem a match generated by the AFR system to be a true positive.

Person(s) of interest

This term includes people wanted on warrants and suspects for particular crimes. It can also potentially include missing persons and vulnerable people (e.g. dementia sufferers) and for intelligence purposes.

Probe image

The still image of a unknown person which is processed by the AFR technology.

Candidate image

Image of person within watchlist

Possible match AFR Identify operator believes probe and candidate image are the same person.

3. AFR Locate

The system works by means of a pre-populated **Watch List** which will contain information and images of subjects and a pre-defined response should these subjects be located by the system.

Watchlists will be both proportionate and necessary for each deployment with the rationale for inclusion detailed pre-event in the AFR Locate deployment report.

Primary factors for consideration for inclusion within a watchlist will be watchlist size, image quality, image provenance and rationale for inclusion.

The numbers of images included within a watchlist cannot exceed 2,000 due to contract restrictions but in any event 1 in 1000 false positive alert rate should not be exceeded.

Children under the age of 18 will not ordinarily feature in a watchlist due the reduced accuracy of the system when considering immature faces.

However, if there is significant risk of harm to that individual a risk based approach will be adopted and rationale for inclusion evidenced within the deployment report.

The decision for an AFR deployment wherever possible will ultimately be made by the Silver Commander with the DSD project team acting as tactical advisors. Wherever possible the deployment of AFR Locate should be detailed with the Silver Commanders Tactical plan.

If a deployment does not feature a Silver Commander the rationale for deployment will be ratified by the Digital Services Division Inspector and be detailed within the AFR Locate Deployment Report.

A Deployment Report must be completed prior and finalised post deployment, this document will summarise the intelligence profile for an event, detail the rationale for deployment as well as rationale for watchlist composition. This document should also be used to capture lessons learnt from each deployment.

AFR locate deployments will be considered to ensure perception of bias is minimised against communities with protected characteristics.

AFR locate will be limited to overt deployments and as such RIPA is not applicable however the guiding principles are considered.

This system is comparable to ANPR but with Faces, and views live feeds obtained from CCTV footage. South Wales Police currently has the following 3 types of deployable solutions which are available for use throughout the Force area:



Mobile AFR Vehicle



Portable PTZ Camera



Portable Static Camera



Usage

Public Events or Rapid Deployments

Pre-Planned where distance or 360 options are required.

Pre-Planned, ideal for narrow pinch points or building.

All solutions can be used both indoors and outside

Distance

Upto 75m

Upto 75m

Upto 20m from Subject

Power

Consider Refuel

Requires Power Feed

Powered by Ethernet

Network

Within the Vehicle

Ethernet Connection required from Camera to Operator (upto 100m)

Operator

Within the Vehicle

Sited within 100m from Camera requires a direct cable link.

The systems also has a full CCTV capability and will be recording permanently for duration of any Facial Recognition deployment but can also be used independently for CCTV purposes. The CCTV will be retained for 31 days at which point will then be automatically deleted.

South Wales Police first deployed this system in a live operational deployment during the 2017 UEFA Champions League Finals held in Cardiff achieving the first ever UK AFR Arrest.

There are 4 deployable vehicles all equipped to the same standard, with a vehicle located in both Eastern and Western BCU, the other two vehicles are based in Headquarters and are available upon request.

The AFR vehicles are multi-functional, it is the operators responsibility to ensure the vehicle is displaying the correct signage according to use. Magnetic signs are available to advertise the vehicles current use.

The AFR vehicles cannot currently be utilised for AFR Locate whilst they are in motion. Not only would there be a considerable decline in system efficiency but there would also need to be significant vehicle upgrades to allow this. There are currently no plans to carry out these upgrades.

During an AFR Locate deployment signs advertising the use of the technology will be applied in the proximity of the vehicle to ensure wherever possible an individual is aware of the deployment of AFR before opportunity to capture the individual's image.

Any observed avoidance by an individual of the AFR camera does not in itself justify grounds for an arrest.

3a. Managing Security

The security of both the system and data contained within it are of paramount importance and are both protected in different ways.

At present AFR Locate is delivered via a laptop based solution. The devices have three levels of protection, the first is a BitLocker which is on power up and the second being a Windows user login and the third being a software application login.

The base live time data which comprises of the Warrants database and NICHE suspects is contained within a shared drive accessible and administered by DSD. This drive is administered by PC 5536 Dominic EDGELL. There is a capability for additional access to be granted to other internal colleagues on an event by event basis to populate specific Watchlist however this is removed immediately post event and in any case within 24 hrs.

Should there be a specific need for a restricted population of a WatchList a password protected folder will be created within the shared folder in consultation with the information owner.

For the purpose of event updating a USB solution will be used by means of 2 Encrypted password protected USB sticks. These sticks will always be held solely by the Event AFR SPOC and will be allocated for the following purpose:

- USB 1 – Dedicated Import / Updates
- USB 2 – Dedicated Spare

The USB will be deleted immediately post deployment and in any case within 24 hours.

During any deployment, a dedicated AFR SPOC will be appointed and will be responsible for the updating of the system for the event duration.

Wherever possible when the watchlist includes information and intelligence originating from the Niche RMS application the export will take place as close to the deployment time as possible to ensure data accuracy.

Technical Support will also be supplied in the first instance by the AFR SPOC

3b. Guide to Disposal Options

For the majority of Deployments within the Force area we will be utilising a colour coded process for managing information contained within Watch Lists.

Red - Observe and Contact the submitting author whose details will be included as part of the Alert Pop Up information. This could be a specialist department or agency or the Event Silver Commander.

Amber - Interact or Engage with information this will also include the information as to why, who the owner is and any pre-determined requirements. Predominantly used for Warrants.

Purple – Interact or Engage with information this will also include the information as to why, who the owner is and any pre-determined requirements. Suspected of committing criminality (shown as suspect or wanted Niche RMS)

Green - Acknowledge and record or advise local resources, this will be used for Ticket Touts, football risk or other low level issues.

Blue – Friendly (No Action), this often includes Police employees to ensure system effectiveness.

There is an option that Red lists can contain information of a restricted nature and this can be defined and configured so that an operator will only see the image of the person who has been matched.

All of the data relating to this person can be hidden and replaced with a URN and owner details in order that should a Red subject appear the Operator will monitor and observe the subject and contact the owner for action details.

There are a number of Tactical Options also available surrounding RAG Disposals which can be considered for example the aligning of Intervention Teams to respond to Red or Amber alerts. For RED activations, the instructions will be clearly displayed on screen for the operator and who to contact.

Amber Activations, the operator using the Airwaves Radio system will contact the assigned Intervention team directly by call sign, e.g

“XX00 TO XX00, MALE / FEMALE SUBJECT IS WALKING FROM DIRECTION TOWARDS DIRECTION, THIS PERSON IS A WHITE MALE / FEMALE, WEARING A TOP, BOTTOMS, FOOTWEAR, WITH HAIR AND IS TALL. INFORMATION DICTATES THIS PERSON IS (INFO FIELD)”

A Green activation will dependent on the information be passed as:

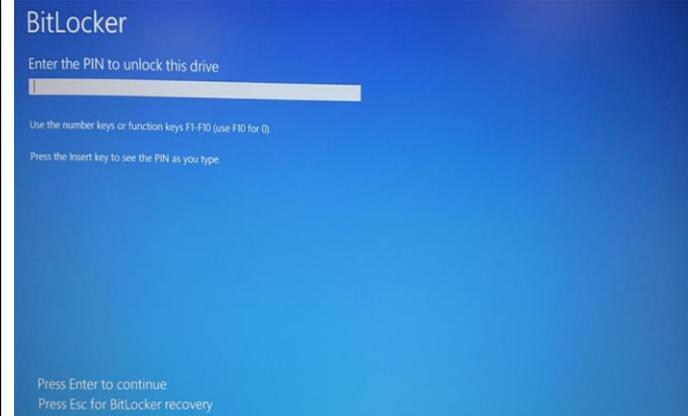
“XXXX TO UNITS AT LOCATION, NAME HERE HAS ACTIVATED AFR AT (LOCATION) AND CURRENTLY WALKING TOWARDS (LOCATION). THIS PERSONS IS BELIEVED TO BE INVOLVED IN (CRIME TYPE), (SURNAME) IS A WHITE MALE / FEMALE, WEARING A TOP, BOTTOMS, FOOTWEAR, WITH HAIR AND IS TALL. FOR INFORMATION ONLY.

3c. Using the AFR Locate Application

This document will guide you through the process of Operating AFR Locate application from initially logging into the Laptop and launching the system.

“Switching on the Laptop – Dealing with BitLocker and Logging In”

The Laptops being used for this purpose are equipped with **BitLocker** which is an additional password / security feature when the laptop is first turned on.

	<p>When you first power up the Alienware Laptop you will be greeted with this Blue screen asking you to enter the PIN</p> <p>This will be provided to you on your deployment instructions.</p>
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The computer will then revert to a standard windows login

Press **Ctrl, Alt & Delete** to bring up the login screen.



Enter the username and password provided.

3d. How to launch the AFR Locate application

“NeoFace” is the program which is used for Facial Recognition, once you have logged into the Laptop the “NeoFace” program will automatically Launch, if it doesn’t it can be accessed via the Desktop.

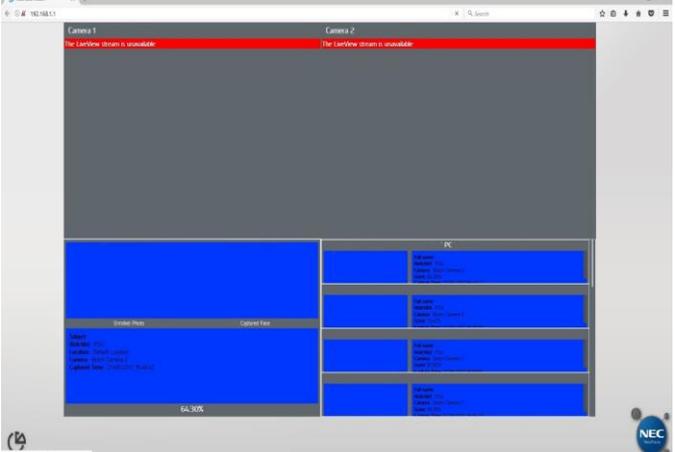


This is the standard **Alienware** Desktop you will see.

If the “NeoFace” program has not opened click on the “NeoFace **Dashboard**” Icon.



Login using the username and password provided.

	<p>Once you have the “NeoFace Dashboard” loading you will see a circular disk In the centre of the screen, this means the program is loading, it can take a few minutes.</p>
	<p>This is the screen you will see next and be familiar with from the training, the “NeoFace Dashboard”</p> <p>You can see on this screen there have been “Alerts” already from a Blue watch List.</p> <p>The Red top bar will display whilst the Cameras are loading.</p>

If after a few minutes the **Red Top bar** has not gone this could be down to a number of reasons, the main reason being the cable from the Camera is not linked to the Laptop.

3e. Roles and Responsibilities

Operator

The operators have all received detailed training prior to deployment. They will monitor the system for alerts and will consider based on probe and candidate image similarity. If an alert is deemed to be a 'correct match' the operator will initiate the appropriate intervention. Interventions will not be made on similarity score alone with the overriding factor image similarity.

All alerts with appropriate meta-data will be recorded contemporaneously in the AFR Locate Operator Log.

Intervention

The operator with final consideration to intervene being the responsibility of the said officer will dispatch the intervention officer.

When an intervention is made the officer will establish the identity of the individual by traditional policing methods.

If the individual cannot be identified or fails to confirm their identity this alone does not constitute a criminal offence and thus does not render the individual subject to arrest.

Where the officer has intervened and established the interaction was as a result of a false alert wherever possible the officer will include the details of the individual within their electronic pocket note book to document the interaction and assist with any complaint should it be made.

The intervention officer will update the operator as to the outcome of any dispatched alert so they can be recorded in the 'AFR Locate Operator Log'.

The intervention officer is to ensure that any correct alerts are dealt with in an appropriate and proportionate manner.

Wherever possible if an interaction is made it is the responsibility of the intervention officer to provide the individual with a privacy notice which will inform them of their rights under the General Data Protection Regulation (GDPR.) It is also encouraged that the intervention officer allow the individual to have sight of the technology in use.

3f. Data Handling

Match reports

The SPOC will download the match report immediately post deployment and in any case within 24 hours, at which point it will be moved into the AFR shared drive and retained for 31 days. Immediately post download the match report is deleting from the AFR application.

The three thumbnail images are deleted from the match report immediately post deployment and in any case within 24 hours.

Register

A register of deployments will be completed to include watchlist composition, alerts, interventions and disposals. This will act as the 'golden record' and assist in completing the AFR Locate Deployment Report.

Data Retention

RMS export of warrants and suspects – updated every 24 hours

Memory stick used to transfer watchlist from shared folder to AFR application – deleted upon watchlist transfer

AFR Locate Operator Log – 31 days

CCTV feed (no audio) – 31 days

Non alert image to include biometric template – not retained within the application

Match report – Images deleted immediately post deployment remaining match report deleted with 31 days.

Images included in match report – deleted immediately post deployment and in any case within 24 hours

Watchlist images, meta-data and biometric template – deleted immediately post deployment and in any case with 24 hours

4. AFR Identify

Introduction

This document is intended to guide you through the process of AFR Identify. This element uses a software program called “Neoface”, the software is used to compare a probe image against candidate images which have been imported from our Custody Database within Niche RMS.

South Wales Police is aware that the custody database is likely to include images relating to both convicted and non-convicted disposals. Currently there is no automated way in which non-convicted disposal images can be removed from Niche RMS. It has been deemed impractical to manually remove non-convicted disposal images from the Niche RMS database that in turn is replicated within the AFR Identify database.

AFR Identify is a process in which investigators can submit an image (known as a **probe image**), whether this be obtained from CCTV, a Photograph or video. This submitted image will then be compared against candidate images contained within the system to identify a possible match.

This process will be managed via a NICHE workflow process and all searches will be carried out by the ID Unit. It is the responsibility of the Officer in Case to task the ID Unit and not the unit to search for images.

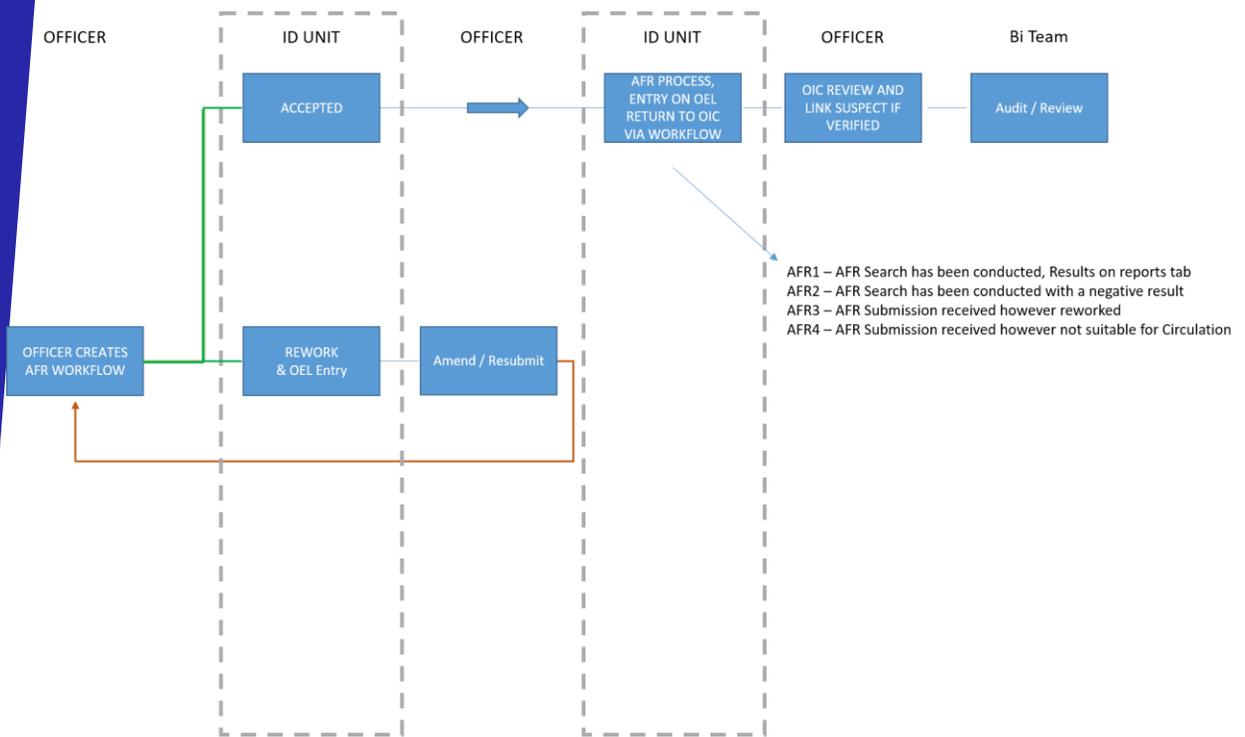
This process will streamline the way in which we identify suspects, and also give an additional intelligence tool to officers dealing with crimes in South Wales.

Only officers and staff who have completed the relevant training will be authorised to access the application and perform searches.

4a. Process Map / Disclosure

The process is a 2-way engagement managed via NICHE between the submitting officer and the ID Unit.

Only trained staff will have access of the AFR Locate application and be able to perform searches, these staff will predominantly be based within the ID Unit. The Force ID unit operates 7 days a week and between 0800 and 2200 and will only receive submissions via Niche.



Out of Hours Requests

The OIC will contact via Airwaves the Public Service Centre at all other times not mentioned above with any AFR critical enquiries. THE PSC Intelligence desk will act as the AFR operator for this process. The image will be sent to the PSC Intel inbox via email attachment.

The submitting officer as soon as practicable will submit the relevant critical workflow request.

The above process map is to be followed with the AFR 1-4 being proceeded with 'C.'

PSC Intel will only undertake critical out of hours enquiries. Critical enquiries will be rationalised by FIM based on current risk and demand.

Important

The AFR Submission form will be used to record the process. If a possible match is identified it will be returned to the requesting officer via Niche and added to the reports tab. The officer will review the AFR report and consider in their opinion whether they believe a possible match has been made. If a match is believed the identified individual is to be added to the occurrence as a suspect. If it is believed, a possible match has not been made this will be detailed within the occurrence enquiry log.

This process should be subject to the same disclosure as any other unused material.

Disclosure

Use of this software system should be disclosed to the prosecutor on the MG6 (Section 9 'Any other Information'). If a 'Not Guilty Plea' is entered, this must be recorded as a separate item on the MG6c as follows: "Material relating to the comparison between the probe image and the defendant's custody image using the Automated Facial Recognition System"

4b. What is a useable image

The whole system is based off an Algorithm which measures a number of facial features and their distance from the eyes, therefore the more head on the image the better the result.

Whilst opposite are a guide to the ideal image, the system can search off non perfect images however the following must be visible:

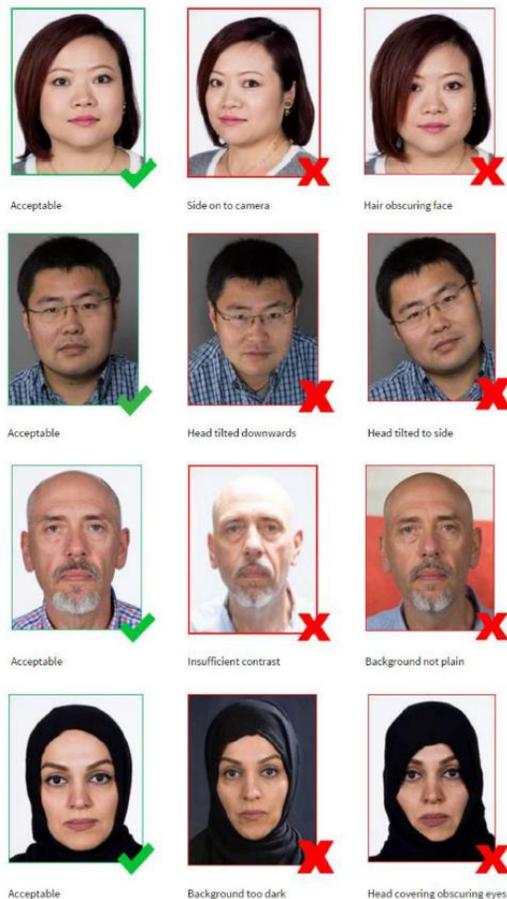
- Both Eyes
- Nose
- Shape of the Face

The system works significantly better without glasses being worn due to the reflection however, the system will search on glasses wearers.

Headwear is another contributory factor which needs to be considered, baseball caps are not a prohibitor for submission however a low peek will reduce the success of the search.

At present the system can only search images, whether these be photographs, CCTV stills or social media images.

Phase 2 of the project will see a Video import capability be introduced whereby video footage can be played into the software and identification can be made without the need for still images.



Images with multiple persons

The system has the capability to identify multiple faces within an image, e.g. if you have a photograph of a crowd at a football match or a nightclub still the system can identify more than one person.

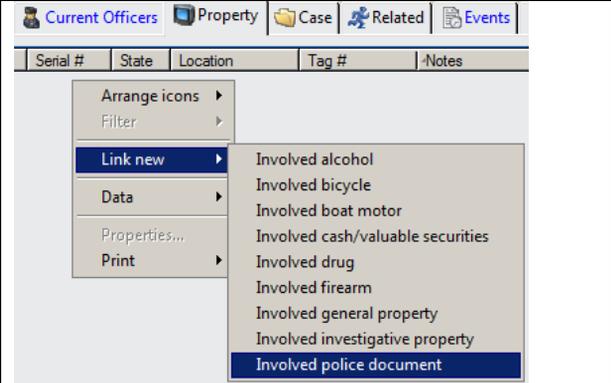
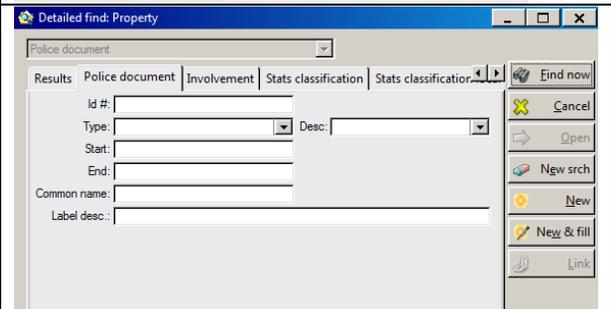
At present the system and algorithm are constantly improving and the technology is consistently evolving therefore always submit an image as what may not identify today may tomorrow.

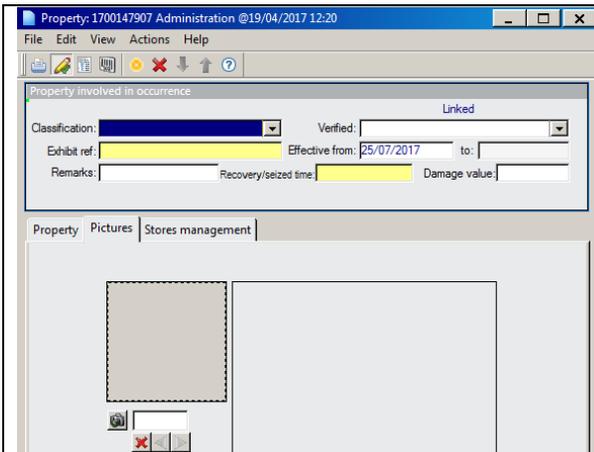
Image Advice

The ID unit operate between 0800 and 2200, 7 days a week and are available to provide real time advice and assistance to investigators. Please also keep up to date with updates and advances via BOB.

4c. Saving an image to Niche

The image is to be saved in NICHE and specifically within the property tab of the relevant occurrence.

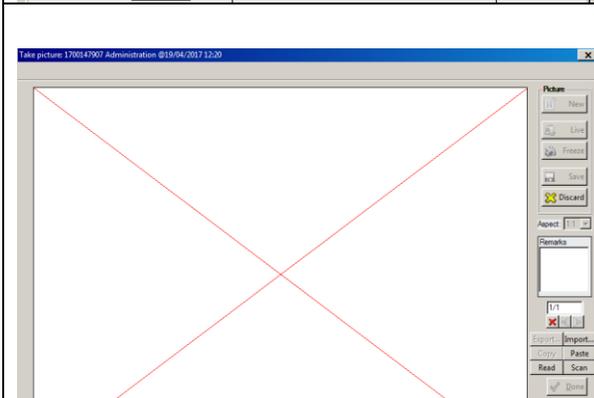
	<p>On the property tab of the occurrence, right click and select Link New.</p> <p>On this tab you need to select Involved Police Document.</p> <p>This will open a new window where you can add an item to the occurrence,</p>
	<p>This is the standard property adding tab, firstly you need to click Find now, which will then un-grey the New & Fill tab.</p> <p>Click on this New & Fill tab and it will launch a new window to add the image,</p>



This is the New & Fill window, you will now need to complete the fields as follows:

Classification: **Evidence**
 Exhibit Ref: **User Defined**
 Remarks: **Probe Image**
 Recovery Time: **User Defined**

You then need to click the camera icon which will launch a new pop up window.

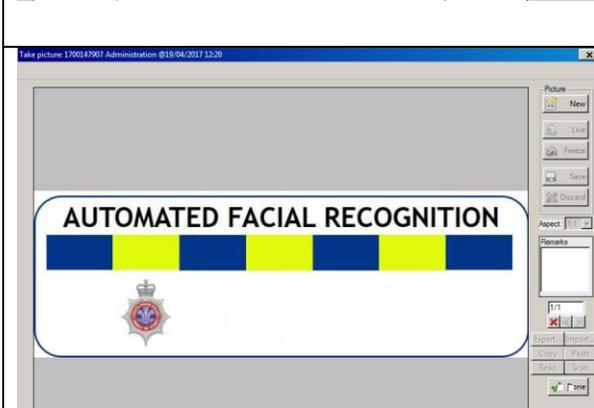


This is the image addition window and is where your Probe Image will be stored.

Click on the **New** tab at the top and this will un-grey a series of options at the bottom of the page.

You will then need to select **import**.

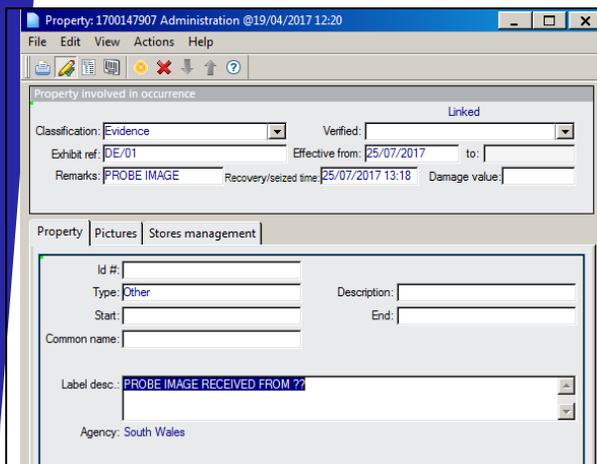
This will open a windows explorer window where you can select the file you wish to add and click OK.



As long as you have selected the image it will now be displayed in the white box as shown.

You now need to click the **Done** button in order for the image to save into the system.

All that is left to do is to complete the Property Information Tab.



Selecting the Property Tab you now need to complete the following 2 fields as below:

Type: Other
Label Desc: Free Text detailing where the image came from.

All you need to do then is press the **x** in the top corner and the image is saved to Niche.

The image is now saved within Niche and is now accessible to any person with NICHE Access, this will assist the ID unit in identifying the image and create a standardised image storing process.

4d. Submitting a Niche Workflow

Once the image has been added to the property tab complete the relevant workflow. This is the same process to any other workflow within NICHE RMS.

Right Click at the top of the occurrence and select 'Start Workflow'	
From the drop down menu select 'Automated Facial Recognition'	
Select either 'AFR Request – High priority' or 'AFR Request – Low Priority'	

A HIGH request – This is for requests which need action within 24 hours, during ID Unit hours the office need to also be made aware. These requests should only be used for serious offences.

A MEDIUM request is a standard request, these will ordinarily be completed within 7 days.

What happens next

The image will be submitted to the operator for consideration, the team will evaluate the image to establish whether it is of sufficient quality to be used as a probe image. The ID team will then have three options.

1. Rework the task workflow

It is likely that the OIC has not submitted sufficient information for a search to be carried out, the rework will be include an AFR 3 OEL entry detailing additional information required.

2. Decline the search

It is likely that the image is not of sufficient quality to carry out a search.

3. Accept search

The operator will then run the search against all images held within NICHE nominal who have been through our custody suites, there are approximately over 450,000 images.

The operators have been trained to undertake a facial comparison between the two images without the introduction of any other information or intelligence.

When the operator finds a possible match they then may when appropriate research the intelligence relating to the identified individual.

This will be followed by:-

Positive identification(s)

The operator will complete the workflow and update the OEL with an AFR 1 entry.

The AFR form will be completed to include the probe image and normally one candidate (custody nominal image.) Where the ID team consider it viable for more than one likely match a further two candidate images may be included. As well as the image, the relating Niche nominal number of the identified person(s) will be included. The AFR form will be added to the reports tab within Niche RMS.

Negative search

Based on the image provided the probe image has not been matched with any candidate images, the workflow will be completed followed by an AFR 2 entry.

Unsuitable Image

If the image is unsuitable for AFR circulation due to quality then the AFR4 code will be used "IMAGE NOT SUITABLE FOR CIRCULATOIN".

AFR 3 will be utilised where there is a likelihood that a better image of the individual may exist.

5. Contact Information

ID Unit Enquiries: 83245

ID Unit SPOC: Dave SMITH / Paul HAYES  02920 571582
promat@south-wales.pnn.police.uk

DSD LEAD: Insp 4156 Scott LLOYD  70381
Scott.Lloyd@

DSD SPOC: PS 3213 Paul Newcombe  70844
Paul.Newcombe@

PC 5536 Dominic EDGELL  29121
Dominic.Edgell@

