IN THE HIGH COURT OF SOUTH AFRICA

GAUTENG LOCAL DIVISION, JOHANNESBURG

CASE NO: I01-2017

DATE: 2017-07-28

INQUEST INTO THE DEATH OF:

AHMED ESSOP TIMOL

BEFORE THE HONOURABLE MR JUSTICE MOTHLE

ON BEHALF OF THE NATIONAL PROSECUTION AUTHORITY:	ADV PRETORIUS
	ADV MALOTWA
	ADV SIGN
ON BEHALF OF THE FAMILY:	ADV VARNEY
	ADV MUSANDIWE
	ADV FAKIR
ON BEHALF OF THE SAPS:	MR LITHOLE

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COURT: Yes, Mr Varney?

MR VARNEY: Thank you, M'Lord. M'Lord, before we call our next witness we would like to hand up a few Exhibits, some of which we will be referring to in this morning's evidence. My junior had been working on the Exhibit numbers. It might be helpful if I handed up for you a bundle of documents and work through them to alot them Exhibit numbers.

COURT: Have you made copies to other counsel?

MR VARNEY: All of the counsel have copies.

COURT: Okay.

MR VARNEY: M'Lord, perhaps we can start with the copy with the faded 1914 Act, which we referred to yesterday. Mr Frank Dutton's evidence when he made reference to the personal file of Mr Rodrigues that reflected conviction for statutory perjury and 1914 Act 16. We would like to give that Exhibit number H9.

COURT: H9?

MR VARNEY: Yes.

COURT: Yes?

MR VARNEY: Then perhaps we can move on to the resume, the CV for our witness this morning, Mr Tivesh Moodley and we would like to make that part of volume C and the Exhibit number would be C9.

COURT: Yes, C9.

MR VARNEY: And then the report drawn up by Mr Moodley which has the letterhead TNI Dynamatics, dated 24 July. It is also part of

volume C and the Exhibit number would be C10. M'Lord we have also supplied photographs downloaded from Google Earth, these are aerial pictures of John Vorster square and the Exhibit number would be C11.

COURT: It is marked accordingly.

MR VARNEY: And finally, Your Lordship we might make reference to a photograph that appears on the front cover of the Rapport newspaper. There is no need to give this particular photocopy an Exhibit number because it is already in volume D at page 95. It is simply a blown up version of that photograph.

COURT: *Ja*?

MR VARNEY: M'Lord, that concludes the Exhibits for this morning. With the leave of the court I would like to call our witness for this morning.

COURT: Yes?

MR VARNEY: He is Mr Tivesh Moodley.

CLERK: Your full names and surname?

WITNESS: Tivesh Moodley.

CLERK: Do you have any objection in taking the oath?

WITNESS: No.

CLERK: Do you swear that the evidence you are about to give is the truth, the whole truth and nothing but the truth? If so, please raise your right hand and say 'So help me God.'

TIVESH MOODLEY: (duly sworn statement)

COURT: Mr Moodley you may sit down if you wish to. Just make sure that you speak in the microphone. --- Okay.

Yes?

EXAMINATION BY MR VARNEY: Mr Moodley, good morning and thanks for taking time out of your schedule. I know as an aeronautical engineer you have a lot on your plate and we are very grateful. Thanks again for taking time out of your schedule to prepare a report which we have submitted to this court. Before we deal with the report, can you give the court a sense of your experience, education and expertise, please? --- M'Lord I am a 43 year old male. I graduated as an aeronautical engineer in 1998 and worked up until 2012 quite heavily as an aeronautical engineer specialising in trajectory calculations for weapons, typically bombs, missiles, aircraft, helicopters.

Thereafter I worked mostly as a trajectory specialist on motor vehicles and their basic motion through different manoeuvres, skidding, swerving and high speed driving, low speed driving. So, I have almost 19 years experience in the field of trajectory calculations in air, land and on water.

Thank you, Mr Moodley. Mr Moodley can I just check that you have certain documents with you. Can you confirm that you prepared a report for this court on behalf of the Timol family, dated 24th July dealing with your views on aspects relating to the trajectory of the fall of the late Mr Timol? --- Yes, I do.

And you have a copy of that report with you? --- M'Lord, I do.

Can I just check that you also have copies of other

documents that we might refer to. Colour photographs depicting aerial, Google earth downloads of John Vorster square, the building? --- M'Lord, I can confirm I have 5, actually 8 pages of aerial photographs in colour of John Vorster square and the surrounding area.

And you also have a picture taken of room 1026 which depicts the scene shortly after the fall? --- M'Lord, I do have that picture.

M'Lord, just for the record, this photocopy has been marked C8, it was handed up, I think yesterday. Mr Moodley before we ask you to guide us through your report, did you have sight of various documents and perhaps I can take you through, you can just confirm whether it was the case or not, and these are documents that you would have consulted with in preparing for the report as well as preparing for your testimony today. Firstly the affidavit of warrant officer Deysel. --- I do.

Brigadier Pattel? --- I do.

Sergeant Rodrigues? --- I do.

The affidavit of Token Ali who was at the filling station and heard the body fall? --- I do.

Dr Holland who prepared a forensic pathology report? --- I do.

Dr Naidoo who also prepared a forensic pathology report? --- I do.

Dr Scheepers who had prepared a post-mortem report? ---

I cannot recall having seen that one.

Okay, we might have to come to that one. And did you have sight of the finding of the magistrate [indistinct]? --- I do.

Mr Moodley, did you visit John Vorster square to inspect the building and if so, can you recall which places you inspected? --- I visited John Vorster square last week. I basically went to room 1026 on the 10th floor and I went to the roof just directly above room 1026 and I also walked to the site where it was alleged that the body had landed.

Thank you. Now that we have that background out of the way, you can now guide us through your report and please be aware that we are all lay people when it comes to engineering and mathematical calculations, from time to time you may have to explain to us what certain technical terms mean and perhaps begin with the basic data that you gathered. --- M'Lord, I will. So having received the information and the documents from the counsel, Webber Wentzel, I went through everything that would pertain to information that would assist me in determining what typical trajectories the body would move through the air with.

The basic data I gathered was of Mr Timol, a height of 1.6m, a weight of 61kg and from the pathology reports that I saw it was evident that Mr Timol was slender in built. I also reviewed the security police's account of the incident of late Mr Timol's fall. It basically said that Mr Timol was in good health and in good spirit at the time of the incident, so I concluded from that he would have been fit and he

would have had full capability and movement in his body so that he would be able to use his limbs to the best of his ability, given his weight and his built.

I also learned that Mr Timol ran towards the window, opened the window, climb onto the window sill and jumped. In the midst of jumping he was allegedly restrained by a security officer who grabbed onto his leg. I then on, when I went to John Vorster square I looked at the area around the window, I looked at the window in detail. I looked at the mechanisms that the window had and I would like to describe it. The window that Mr Timol allegedly fell out of can be described as a steel window frame that opened 90 degrees... at a 90 degree angle to the frame and had a hinge point that was approximately 27cm from the right edge.

The window pane had a retreating lever that was used to latch the pane onto the window frame that resulted in the window opening in a clockwise direction from left to right. Furthermore the window pane was braced with an additional lever that could be locked to prevent the window from closing in windy conditions. In the report that I wrote I drew the orientation of the window and with the dimensions of the window being 155cm high, a width of 71cm and the area that Mr Timol had to fit through was 44cm.

I then also looked at papers on forensics regarding people jumping from buildings and cliffs... [intervene]

Mr Moodley if I can interrupt you just for one moment, before we move on to the trajectory, given the police version that you have

just recounted for us, and given your examination of the physical attributes of room 1026, and the attributes and measurements of the window itself, would you be able to give this court an approximate estimation of how long it might have taken Mr Timol to move from his seat and for that purpose I would like you to consult Exhibit C8 which has a blown up photocopy... photograph of room 1026 and according to the evidence Mr Timol was seated in seat B and Mr Rodrigues in seat A.

We know from the evidence of Mr Rodrigues that he allegedly exited out of the left window, close to where Mr Rodrigues is standing. Would you have a rough estimation of how long it would have taken Mr Timol to essentially get onto that window and exit? --- M'Lord, I can try but this can be done experimentally as well, which we have not done yet but I would like to state that from what I read, Mr Timol sitting on chair B had to get up out of chair B turn around, run towards the door and as he ran towards the door he would have to turn around again, run towards the left table, manoeuvre around that left table and run on the left side of the table that he was sitting at.

He would then need to basically climb that window sill which is approximately 950mm high, climb onto the ledge and then jump. If I had to add some times to that, I would say to move from B in the direction of the door would probably have taken him 1 second, to move from the door back to the corner of the table, maybe another second. To manoeuvre around there, another second, so three seconds and to climb up onto the window sill about 2 seconds. So

that is a total of 5 seconds if he did it efficiently.

If he did it and he took his time in doing that because I believe that he asked to go to the toilet and that is why he moved in the direction of the door, it would meant that he would have walked towards the door. I believe that to move from B to basically to the door would have taken him about 2 seconds, and then to run the rest of the way it would have taken him a few more seconds to get to the corner. So it could be between 5 and 8 seconds for him to get onto the ledge of the window. So if he was sufficient, about 5. If he basically took his time to move towards the door first and then run back towards the window, about 8 seconds.

Thank you, Mr Moodley. Please proceed with your evidence in relation to the trajectory, I believe you were on page 2 of your report. --- Yes. So, if you look a figure 1.2 it gives you some basic orientation dimensions of how somebody would jump from a building or a cliff. Important dimensions to remember is the person's centre of mass, the centre of mass is a very important parameter because most bodies will rotate around the centre of mass. The height that the centre of mass is above the ground is also important because that would tell us the time it took to fall through that height.

The flight distance would be the distance from the point of take off to the point of landing in a horizontal plane. The launch angle and the launch velocity is extremely important because that sets up the initial condition. Most people who would intend on jumping would always launch partly vertically and partly horizontally because you are

lunging right, and in my sort of analyses of what a jump would be, somebody is trying to escape is they would try and jump at full force so they could get away as fast as possible and the momentum that they had built up in towards running there, combined with the adrenaline would give them energy to jump at a full force.

When we do a trajectory calculation it is very important for us to determine a few factors. The first factor that we need to understand is how long would it take for a body that is falling to reach the ground and having known that, based on the initial conditions of the launch, how far would that body land from the initial launch position. The final velocity at the instant of the impact and the impact forces or the change in moment when the body contacts with the ground.

What I basically did thereafter was, I looked at the descriptions of what people state in statements at how the late Mr A Timol fell and it was important to take all ... everybody's considerations... take everybody's statements into consideration, so and Mr J Rodrigues' statement stated that Mr Timol allegedly jumped out of the window from room 1026. His statement had a page missing which described the entire action so we could not draw more there. All we could assume from that statement was that the person jumped out of the window.

Then there was a Mr J G Deysel's statement who basically gave a statement of the body being found on the ground and his statement stated that the deceased had fallen into some shrubbery on

some sandy ground. The deceased's body was laying perpendicular to the building with the head pointing towards the building and the legs pointing towards the road. The deceased was laying on his stomach with his face pointing slightly to the right.

This extract was taken out of the forensic pathologist's, Dr S Naidoo's report. Then on Monday we heard advocate E A Matthis's testimony. Advocate Matthis' recollection of the body falling was as follows: The body was falling horizontally on its side, not head or feet first. The body was falling parallel to the building with the head in the direction of the motorway. That means the head was facing in a westerly direction. The body landed approximately 1.5m away from the building, in the same direction parallel to the building it was falling and the head was still pointing in the direction of the highway or motorway in a westerly direction.

On the ground the late Mr Timol had one hand extended over his head while the other hand was under his body. When advocate Matthis looked out the window he saw a body laying approximately 1.5m away from the building in a similar posture as what he saw at falling. He also said he looked up and when he looked up he did not see any window open. Reviewing these statement and these testimonies of these people basically what I then did was looked at each one of those statements, so if you looked at Mr J A Rodrigues and the jumping statement, I took two scenarios with that.

One where somebody would jump, with maximum sort of energy to try and get away as far as possible, and another scenario

where they would just step... so that would be scenario 1 and 2. I then took Mr J A Deysel's version and I created another two scenarios. That would be scenario 3 and 4. So scenario 3 would be basically somebody put onto the window sill in a seating position and while seated they are pushed from above the centre of gravity, so anywhere above the centre of gravity which is typically around the waste area, so on his shoulders or above his back shoulders, head possibly.

And then the other scenario, scenario 4 I looked at whereby somebody or he would climb out, legs first and then be pushed by the head and shoulders out the window so that he would land in the same direction looking at the building. So basically when he exited in scenario 4 he would be looking into the room with his legs out of the window and basically either pushed or propelled outwards. Version... scenario 5 and 6 refer to Matthis' testimony and in that version of Matthis' testimony he says that the body fell parallel to the face of the building in a horizontal position with the head pointing in the direction of the motorway.

I basically created two scenarios whereby I did not believe a body could fall in that direction if it exited out of that window, because the window opened clockwise with the class pane, and I will refer to a figure that is later on in this report that basically says that Timol could not have exited the window towards the right because the glass and the window pane would have obstructed him from doing that. So he either exited in that orientation below the window, or above the

window, so it could bring the roof into play in that. So that with Matthis' evidence I basically looked at the scenario of a body being thrown from the roof down, parallel to the building or rolled off the parapet wall.

I will go back to how again.. the approach I used to complete the trajectory. In the engineering world there is different mathematical models but the two common solutions are a kilometric solution which only looks at time, distance and velocity and then there is a [indistinct] systems of equations that solves a dynamic system of equations that basically looks at external forces and internal forces. Your external forces would typically be the gravitational force that the earth exist on our body due to rotation. The aerodynamic force due to the density of the air and the speed that you are travelling through air and the third force that I looked at was the ... let me just go back to it, an impel force that would be generated either internally by somebody using their legs to thrust themselves, using their hands to propel themselves, or somebody pushing or falling at them.

So the external and internal force is there and what we then do is all this analogies based on Newton's laws of motion, right which basically led to a lot of engineering problems being solved when the apple did not fall too far from his head. I then researched information on the aerodynamics, because the gravity is fairly common and is well-known. His mass would not chance during his trajectory, it is constant. The gravitational force would be constant because he is not travelling that far, it is 35m. So the aerodynamics that I have looked

for was basically the aerodynamics of a body in different posture positions and I will refer to figure 3.1 for that.

The Taylor University in Malaysia did computational fluid dynamics analyses and solutions around the drag of a body in different postures when it basically falls. So a person who is standing, right would almost have the highest drag coefficient. A person that is squatting or in a supine position, so supine position means that the airflow or if you picture somebody flying head first, is supine where the air flows through the smallest cross section of the body which would be his head and shoulder area, has the lowest drag coefficient.

The sitting position has a intermediate drag coefficient and the squatting position also has an intermediate... so I used that report to create and develop the 6 scenarios. Scenario 1 and I will refer to it in the table 1. Basically we calculated the height of the building to be roughly 35m high from the point of impact to the point where the centre of gravity would be on the window sill and if you looked at the height of the roof we then said the roof would be another 3m above that point.

How did I imply impulse forces was, I took approximations of his mass and a relative quantity of his mass and applied it to his body for .5 seconds in impulse, because if somebody pushes you they would push you for a certain distance and release you, because they are not holding on to you, right, they are just pushing. The action of pushing, so it is an impulse force. So it means it is applied over a specific period of time. I then looked at... so if we look at scenario 1

where he jumped, right the height he jumped from was 35m. The impulse force that was applied to his body was 48kg for .5 seconds.

The aerodynamic drag coefficient in a standing position in the horizontal direction was 1, the aerodynamic drag in the vertical direction was .25 because when he was falling through the air feet first, I assume that his body was intact and it is the smallest cross sectional area of his body.

Mr Moodley, you are referring to? --- Table 1.

Table 1? --- Yes.

Page 6. --- I am referring to table 1 on page 6. I then looked at the surface area in the horizontal direction and the surface area in the vertical direction and from there I calculated a trajectory which in section 3.1 it gives you the plot of his trajectory for a scenario where he jumped, where he would have jumped. Given that he jumped would almost 75% of his own weight in a 45 degree angle, I computed that he would have landed 13m away from the building, provided that he jumped leg first.

That is the graph on page 7? --- That is the graph on page 7, right and below that graph is the time that it took for him to reach the ground, which was about 3.65 seconds, right so.. [intervene]

And Mr Moodley in your estimation, 13m would probably taken onto the road? --- From where we were standing at John Vorster square I strongly believe that he would have actually cleared the existing fence that is there, and probably landed on the road. I did not measure the distance to the road.

Thank you. --- I then looked at scenario 2 where I said that Mr Timol would just have stepped out of the window to just get away from his ... from the situation he was in and again the height that he fell from that position was 35m. His impulse force would be equivalent to somebody stepping and I said that he would have stepped with about 20kg force for about .5 seconds. His aerodynamic drag would be the same as when he was jumping and his surface area would be same and if you looked at figure or section 3.2, scenario 2 you would find that he landed... he would have landed 4m away from the face of the building, jumping the same distance and the time that it took is about 2.7 seconds.

Right, so you can see somebody jumping and stepping out of the window there is a big difference in how... the horizontal flight distance that they would cover. I then would look at... I then looked at the situations of Deysel which claimed that his body landed with the head in the direction of the building. In scenario 3 I assumed that he was ... a force was applied above his centre of gravity... [intervene]

Mr Moodley, just pause for a second and to sum up scenarios 1 and 2, neither of those scenarios would fit the police version in terms of distance and positioning of the body on the ground? --- I do confer with that, yes, I would say that. So, the distances are beyond what the police versions are claiming as well as his orientation and direction would be... he would be landing leg first and his head would probably have fallen forward because he had a horizontal force pushing him forward, so his head would lay in the

direction of the road and his legs would lay in the direction of the building. So in the complete opposite direction of what Deysel found him.

I see, and also in terms of his injuries you would have expected to have serious feet and leg injuries? --- Yes.

Massive fractures presumably? --- I would believe so because that would be his most... it would be his main point of impact, that region, his legs.

And presumably his pelvis as well? --- I would not know, I am not a medical expert to basically make a call on that, but if he landed on his feet, knowing the structure of our body the forces would then translate up his limbs, so his bones and his limbs and probably to his pelvis and if you look at how the pelvis is attached to the torso, it is only connected via the spinal area and I think he would have dislocated his spine as well. But not being a medical expert I would not want to comment... [intervene]

That is fair enough, thank you.

COURT: If I may, this scenarios you are painting, did you consider in what direction he was facing shortly before he went out of the window? --- Yes.

Whether he was pushed from the back, we are talking about pushing now, from the back or he was facing the person who was pushing him and whether that would make a difference in terms of the trajectory. --- M'Lord, that would make a big difference. I did say that earlier on, in scenario 1 and 2 I assumed that he was jumping away

from the person so he would be facing in the direction opposite the person, so he was facing the direction of the road, not the building. In scenario 3 he was also facing towards the road because he would have been sitting on the window ledge. In scenario 4 I assumed that he was facing the building, so he would be looking into the window, or looking into the room, more like it and so he would be pushed or he would have propelled backwards, if that make sense.

COURT: Yes, okay. --- So in scenario 3 he would have propelled forward, face forward and in scenario 4 he would have propelled backwards, with this back assuming the trajectory.

Okay. You are on 3.3, right? Scenario 3? --- Scenario 3, so scenario 3.3 basically I assumed that Mr Timol was placed on the window sill in a sitting position, right and then pushed above his centre of gravity, so it could have either been his back or it could have been his shoulders or it could have been on his head, right and that would possibly induce a trajectory that would result in him somersaulting through it which would probably explain why he landed with his head facing the building. In that particular scenario I used a pushing force because now the impulse force is no longer his legs, which is the stronger limbs. The pushing force now would be hands, right or ... and I used an impulse force of 15kg which is a fairly medium sort of force that you would use to push with your hands.

I assumed that he was pushed slightly above his centre of gravity, his shoulders, pushed at his shoulders and in that situation there the height is still the same, 35m and you would find that he

would have landed 3m away from the building. His time to fall was 2.8 seconds, the 35m and again what I did there was I used aerodynamic coefficients presented between sitting and standing, so I took sort of a medium and I used .7 as a parameter to look at approximating his body through a somersault, right and that resulted in him landing a distance of 3m away with a time of 2.8 seconds.

If we are happy I could move on to scenario 4, unless there is questions on that? Okay, in scenario 4 I looked at the scenario whereby his legs would have been out the window and he would have either used his hands or somebody would have pushed his upper torso out the window, so he would fall backwards through the air and he would land exactly like the way Deysel said with his head in the direction of the building and on his stomach. In that particular situation I used the same pushing force of 15kg to be represented of somebody pushing with hands, right and I assumed that aerodynamic position of him fly horizontally perpendicular to the building and I got a distance that he would have landed away from the building at being 3.1m.

So, what we are trying to get at is that there is not much of horizontal distance and difference between scenarios 3 and 4 the way he landed. If we have any questions on that I am willing to take it, otherwise I can move on to scenarios 5 and 6.

Mr Moodley before we move on to 5 and 6, so just to confirm that scenarios 3 and 4 do in your view result in Mr Timol landing in the orientation as described by Mr Deysel? --- Yes.

But it was scenarios 3 and 4 that would, in your opinion, involve a push out of the window? --- Yes.

Thank you. --- So instead of using legs to propel themselves, hands would have been used to propel his body.

But to be clear, could it potentially be his hands or somebody else's hands in terms of pushing? --- At this point in stage, I do not believe he would be able to move his hands as much as somebody who had free hands to be able to thrust him, so for .5 of a second that I used it would be a full extension of one's arms, whereas if you looked at somebody sitting on sill, their hands would have moved probably less than 100mm if they had to release themselves from the window sill, right? So if somebody pushed him, they would have full extension so probably between .5m and .8m which would confer with the impulse force that are applied, but if somebody had to do it themselves, the impulse force would be much lower because the amount of force application would for over a much shorter distance.

So without the aid of a push in your view, am I correct in saying, that he would not have travelled a horizontal distance of [indistinct] he would have likely have come a bit closer to the building? --- Much closer to the building, so ... because his impulse force would have been much lower.

Thank you. --- Moving on scenarios 5 and 6 and that is basically looking at scenarios in line with advocate Matthis' testimony where according to him he was positioned on either level 4 or 6 of the

building and said that he had good visual sight of the body falling passed the window. His description of the body falling passed the window was horizontal and parallel to the building. In my opinion, given the way that the window opens, it would be very difficult for an individual to be able to orientate his body leaving perpendicular to the face of the building, rotates in mid-air in a matter of 3 seconds and passing half way through the building in a horizontal position, parallel to the building.

He would have had to have left his ... the initial condition in that particular position and that is why I took the liberty of looking at what happens if he was either thrown from the roof or rolled off the roof and that is the scenarios 5 and 6. So in scenario 5, right I assumed that 2 people carrying Mr Timol would swing him on the roof, a slight distance behind the parapet wall because I would say it would be quite dangerous for somebody to stand at the edge and try to swing somebody and throw them. They would stand at least half a meter to a meter behind the edge and they would release him.

The force that I used there or the impulse force that I took into consideration there, is only 20kg horizontally and the reason I did that is because those two people had to still carry the body, which weighed 60kg and also generate... so they would carry the body, which weighed 60kg in the vertical direction, and then they would need to generate a horizontal force above that, to thrust the body horizontally. Hence I took 20kg and I used the orientation and the aerodynamic drag coefficients in line with what advocate Matthis said

about the body being parallel to the building and falling purely horizontally.

In that situation I got a flight distance of about 4.2m away from the building, but the height now was 38m higher because we are no longer on the 10th floor, we are on the roof of the building and the trajectory there was roughly 2.85 seconds. I then looked at the same scenario of Mr Matthis and I said what happens if somebody rolled him off the roof of the building, so they would have placed him on the parapet wall and pushed his body, so they would have firstly overcome friction because his body would be laying flat on the surface, right? So they would literally have to push him against... on the... so there will be a rubbing effect of his body onto the parapet wall and then a release effect.

So the force that actually would have been used to release him, would have been very low because once he left the edge, the force would no longer be applied. So I looked at a force of about 6kg which is quite a light force, but most of that force would be used, not the 6, but most of the energy or the force that the people who had pushed him, would be used to actually push him over the surface and when they get him over the surface only a small force would be needed to propel him. That situation I ended up with a distance, a flight distance of 1.2m away from the wall or from the building and his orientation that he would have basically flew in, would have been in line with what advocate Matthis said.

So those 6 scenarios sort of summarises the different

versions of information that we got in terms of how the person had left the building.

I see, if we can just deal with scenarios 5 and 6. --- Yes?

From what you are saying, Mr Moodley there is some differences between these scenarios and the earlier scenarios and certainly that would mean inconsistency with the version of Mr Deysel as well as that of brigadier Pattel who put the body approximately 3m or 10 feet from the edge of the building. In scenario 5 you put the distance from the edge of the building, the horizontal distance travelled at 4.2m and can you just remind us what the orientation of the body would have been on landing? --- So the aerodynamic coefficients that I used would have been in line with the body parallel to the building and falling horizontally, so side or stomach first, impacting the ground.

Right, so ... [intervene] --- So either his one side or his stomach.

So unlike what Mr Deysel says, instead of the head facing the building it would be pointing towards the highway. --- Yes.

And that would be the same in respect of scenario 6, except the horizontal distance travelled would only be just over 1.2m? --- Yes.

In your recollection of the scene outside of that southern wing of John Vorster square would have taken Mr Timol just beyond that, what look like a gutter but we were told is in fact is a light tunnel, but it does have sharp concrete edges, would that have taken Mr

Timol slightly beyond that structure? --- Based on my memory I think that structure is about a meter away from the building. I did not measure it so I would not know, but I would think if it is 1.2 or 1.3m away it could take him beyond that structure into the area.

We are locating the building plans so we will get the exact measurements, but the point I am making is that we are of the belief that had he fallen onto that light well or light tunnel that looks like a gutter, then his injuries would have been substantially different because he likely would have fallen on concrete and probably would hit one or more of those sharp edges and then his injuries would have been very, very different indeed. Alright, Mr Moodley please continue with taking us through your report. --- I think having been through everything, the 6 scenarios I would say that each of these scenarios that I presented here, mathematically and from a mathematical more perspective are correct.

I would like to have believed that the way Mr Timol had launched himself during the jump is in line with what most people would do when entailing to jump. I would like to also believe that the evidence of Deysel with his body... where the head was pointing towards the direction would have only ... would have been the aftermath of somebody somersaulting through the air, perpendicular to it, but having gone through everything I think that somebody jumping out of the window and only landing 3m away is not possible, they would have definitely landed at least between 4 and a half meters and 13m like I said.

The Deysel's version I think is possible, if we knew what and if we had enough evidence of how the person left the body, if we had photographic evidence or something like that, it would have been possible and so is Rodrigues' based on the scenarios that I put together. The question is, who's version over there is the most plausible version and having said that, I do not think in scenarios 5 and 6 that Mr Timol would have been able to launch himself into that orientation given the construction of that window that was there. So, that is basically my 6 scenarios. I think one can read them themselves into what they see, but *ja* I have nothing further to say.

I see, Mr Moodley, finally I wish to return to what allegedly took place in room 1026. You have before you the photograph which is Exhibit C8 and I believe that you have now been given the an English translation of the magistrate's finding. Your Lordship for the record the original version is in volume A from page 1121. The English translation is also in volume A at ... it is right at the back, I have not been given a page number, but it is right behind the original Afrikaans version.

We are interested in looking at the description in summing up of the evidence by the magistrate in relation to what happened in room 1026 and in the English translation that is at page 28, Mr Timol do you have that... [intervene] --- No, Mr Moodley.

COURT: The copy that I have is not numbered, the English translation is not numbered.

MR VARNEY: Is it not numbered?

COURT: No, it is not numbered. What is numbered, however, is the version, the Afrikaans version.

MR VARNEY: Yes, it is unfortunate that it is not numbered. So if you can just, M'Lord count 28 pages from the beginning of the English translation and unfortunately there are no headings to guide us either, so one actually has to count 28 pages. The top line reads 'He said that he sat down on a chair...' Mr Moodley did you find the correct page? --- Yes, I have.

Okay. M'Lord have you found the page?

COURT: No, no, not yet.

MR VARNEY: Not yet.

COURT: Not as yet.

MR VARNEY: On page 27 there are two headings, the court adjourned the court reconvened.

COURT: Page?

MR VARNEY: Well, I suppose that will be page 27. It is not in bold, it is just in capital letters.

COURT: No, I do not think... because there are no... I am unable to get that, but proceed, proceed.

MR VARNEY: M'Lord, I am going to read out the passage if that helps and I think we must number the pages, perhaps we can attend to that after we adjourn. Mr Moodley, I want to revisit what happened in room 1026, according to the summing up of the evidence that magistrate De Villiers provided in respect of the evidence given by sergeant Rodrigues and that here is then to ask you in relation to the

findings of the magistrate, how long you believe it would have taken Mr Timol to execute those moves.

So I am reading now from the top of page 28 and this is the summing up of the magistrate's finding in relation to... or the summing up of Rodrigues' evidence as provided by magistrate De Villiers. 'He said that he sat down on a chair on the southern side of the table, the chair that Gloy had just vacated.' Furthermore on the photo, Exhibit S and I believe that to be the photo that we have provided in C8, a photo of the room and its contents. The witness said that he was sitting on chair A. Do you see that in the photo, Mr Moodley? --- Yes.

While the deceased sat on chair B. A little while after Gloy and Van Niekerk had gone out, that is out the room, the deceased asked to go to the toilet. The deceased was sitting on chair B. As I have already mentioned, both of them got up, Rodrigues said he went to the left and I presume that is his left, with chair C was in his way. At that moment his eyes were on the chair, that is chair C. He pushed it in and then he saw the deceased, he was standing on the right hand side of the table from where Rodrigues was, rushing towards the window.

The witness said he first wanted to go to the left, but the chair that the deceased had just vacated, chair B would have been in his way and he went back to the right where he had trouble with chair A which was in his way. At this moment the deceased was already at the window. The window was already open and he was busy diving through the window. In an attempt to grab the deceased he stumbled

over chair A. He could not even touch the deceased.

When he got to the window he said that he saw the deceased laying on the ground next to the building. He immediately ran to colonel Greyling's office to report and that part of the summing up is not relevant for our purposes. So, Mr Moodley if we were to ask you to give an estimation in your view of the time it took Mr Timol to execute those moves, starting from his position in seat B and eventually ending up at the window and exiting that window, would you still say that it was, I think your evidence earlier was between 5 and 8 seconds? --- So, in my evidence earlier I basically assumed that he had moved in the direction of the door and then basically moved towards his, Mr Timol's left, which is to exit the left window.

If he had just moved from the chair directly around the table into that direction, and to climb up to get out of that window, I would be more inclined to confirm around 5 seconds, maybe 4 to 6 seconds. I cannot see him being able to do that in a shorter period of time, because there is a lot of changing of direction in movement, left then right and then up and every change in movement requires some sort of time and some sort of difference in reaction, so when you think about how he moved, he react according to what our brain would tell us to do, right and that... there is a period where we think about a reaction and then we execute it.

When we look at accidents on people driving, they always consider a reaction time before the person actually applies his brake. In a similar way, for somebody to change direction he would have to

process the information that he wants to change direction and then execute it that he is going to change direction. So there is a timeframe, it does not happen instantaneously.

Thank you. Your Lordship, no further questions.

COURT: Thank you. Advocate Pretorius?

MR PRETORIUS: M'Lord, I have got no questions.

COURT: Yes, advocate Coetzee?

CROSS-EXAMINATION BY MR COETZEE: Thank you, M'Lord I do have questions. Thank you, I understand and I was not present but that witness Pattel testified that the body was laying plus minus 10 feet away from the building. I will transfer it into meters, that is about 3m more or less 3m? If one look at the scenarios that you have established with regard to the distance of 3m, it seems to me that your scenario 3 more or less, that is 3m, your scenario 4 has 3m and for that purpose your scenario 2 has got 4m, that is the scenarios that you... and the scenarios of 3m would that... that is possibly then within what Pattel has testified.

Now, you must just... [intervene]

COURT: Answer, yes. --- Yes.

MR COETZEE: So then, Dr Naidoo testified that the deceased fell head first, head first according to his opinion, head first and then to the right shoulder transferring the body. Would that have made a difference to you, if you knew that or if you take that into account? --- So in scenario 3 I did take into consideration a somersault manoeuvre which means that he would have rotated out the window in a head first

position but he would have completed a full rotation which have then resulted in landing on his stomach.

Now, with regard to the flight time, in other words the time of the duration in mid-air, it seems to me in scenario 1 is the maximum ... the maximum time which is about 3., just over 3.5 seconds and that is more or less the longest period that you anticipate that he might have been falling? --- Yes, sir.

Now, if one take that into account and one take into account advocate Matthis' observation through the window and you have seen also the sizes of this windows, how long observation would he have had of the falling body? --- I do not have it on me here, but he would have fallen at a few meters per second. Definitely more than the height of... so he would have seen it within less than a second, the body passing there because he would have fallen much more than 1.5m, much faster than 1.5m per second which is the height of the window.

Yes, so it would have been less than a second observation? --- Less than a second, yes.

And speaking of that, you have referred to the reaction time and it seems to me that from your CV and what you have said that you also do some accident reconstructions, do you do that? --- I do not do accident reconstructions, but what I do is engineering analyses of vehicles, suspension systems, braking systems, to see how effective vehicles can manoeuvre at high speeds.

If you may ask you, are you... do you know what is the

average reaction time of a person, in other words if I notice ... from noticing something to reaction time, what would that be, the delay? --- If you are driving and you are paying attention, right, it could be between, I would say .4 and .5 seconds. If you are not paying attention it could be a little bit longer.

It could be longer. If we look for example at sergeant Rodrigues, his reaction time, you would not be able to say what would be a person beginning to leave an office with the purpose of leaving an office, what would his reaction time have been? --- No, I could not say that.

Sir, have you done any... and I appreciate your graphs and the maths involved in the graphs, have you done any actual testing for example with crash test dummies in the falling trajectories of that form or that type of substance? --- No, not within this timeframe that we had, but the paper that we used, used experimental data combined with computational fluid dynamics data to work out the drag effect on the body. So another point that I want to raise is this ... when the body fell, the fact that it started with the initial condition of a zero velocity, it took time to accelerate to higher speeds and the body fell mostly with the gravitational force and the aerodynamics forces and stuff was not as large as the rotation forces, unlike in a situation where somebody is sky diving and they have hundreds of meters in which to manoeuvre in.

And obviously it would also be different for people, for example that do cliff diving or do ... where they will purposely project

themselves as far as way from the cliff to do sky diving or whatever they do? --- Yes.

So then with regard to these graphs and the maths that you applied there, there must be some variables that would influence all of these aspects, have you considered any variables, for example the clothing, whether it is something else is on the way down hits like a ledge or anything like that? Have you taken any of those into account? --- In this particular ... at this particular speeds the clothing effect would be form what we call profile drag effect, right, these speeds are still too low for that to be considered as any sort of additional restraint or initial drag coefficient, or... *ja* have any value to it.

And just one issue and I ask this because I have not been to that area and I have not inspected it. Are there protruding ledges from the building? --- From what when we looked out the window that we saw, currently there is a louver sort of face that was installed afterwards, I believe, but the building is almost flat. So if there is anything that protruding I would not think that it would be more than 100mm. There is no balconies or anything below it, or anything, it is almost a flat face.

Sir, you have referred to the parapet wall on the roof. --- Yes.

What is the height of the parapet? --- It is between about I would say 300 and 500mm. It is about knee height for me.

Thank you, M'Lord I have dealt with the questions I had.

COURT: Yes. Any further questions?

RE-EXAMINATION BY MR VARNEY: M'Lord, just one. For purposes of clarification, Mr Moodley it was put to you that, by my learned friend from the police, that according to Dr Naidoo, Mr Timol fell head first. Do you have a copy of Dr Naidoo's on you? --- Not on hand.

Oh, not on hand. In fact at paragraph 22 of Dr Naidoo's report, we will get you the Exhibit number shortly, it is Exhibit C3, M'Lord, his evidence is not quite that he fell head first as in straight down. In fact he says as follows: 'My impressions obtained from the injuries are that the body struck the ground, primary impact with the forehead and the area of the right shoulder, elbow, chest.' If I recall his oral testimony he said the body struck the ground in a side position, striking initially the areas that I just mentioned.

If you wish to comment on that, you may? --- If you could ask a question then maybe I could answer it, but I think you are making a statement.

I am simply making a statement and if there is no comment then ... [intervene] --- There is no comment.

Thank you, M'Lord.

COURT: Yes. Thank you. Thank you Mr Moodley, that will be all from you. Thank you very much. You want to say something? --- No, thank you, M'Lord.

Okay, thank you, you are excused.

Alright, Mr Varney?

MR VARNEY: M'Lord, that concludes the evidence for today. Unless

my learned colleagues have anything further? M'Lord, the only thing that we can do to assist you with your research is to hand up a numbered copy of the English translation of the magistrate's finding.

COURT: Yes, okay thank you.

MR VARNEY: So, M'Lord nothing further. I understand that my learned friend for the police will be calling certain witnesses for Monday and Tuesday.

COURT: Yes. There is something about that...

MR PRETORIUS: M'Lord, there is just one issue, as on the record yesterday, at the closing that we were discussing the calling of brigadier Tshabalala, we have discussed earlier in chambers, I have excused him as I do not believe it is necessary in the light of the affidavit that he presented to the court regarding Mr Ahmed Adam, so I will not be calling him in this regard.

COURT: Yes.

MR PRETORIUS: And by Monday I will be ready to present evidence.

COURT: Okay.

MR PRETORIUS: Thank you.

COURT: You are expecting two witnesses Monday.

MR PRETORIUS: Two witnesses, M'Lord.

COURT: That is a Mr Els and Mr Rodrigues?

MR PRETORIUS: And Mr Rodrigues will be present on Monday.

COURT: Yes. Are they still going by their titles? Sergeant Rodrigues or Mr Rodrigues, you know?

MR PRETORIUS: And Mr Nel, they have not been in the police

service for many, many years, they are not on their title or a rank, they will be mister.

COURT: Then we will adjourn the proceedings until Monday 10 o'clock in this room. Thank you.

MATTER POSTPONED TO 31 JULY 2017

COURT ADJOURNS

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