



STRAIGHT AS AN ARROW

by Aharon Granot

The details of what goes on in the building complex where the Arrow missile system is designed and produced — somewhere in Israel — are cloaked in secrecy. Almost nothing about the site can be revealed, and even the details that can be shared with the public are thoroughly censored.

The expressions on the faces of the tens of engineers who work here are always serious. A weighty task has been placed on their shoulders. In an era when offensive ballistic missiles are a major threat to life and property, their work on the Arrow, an anti-ballistic missile intended to destroy incoming missiles before they can reach their intended targets, can be considered *pikuach nefesh*, a matter of life and death.

In the midst of this key engineering group is Yeshayahu Deutsch. Wearing a black suit and hat, he stands out in an environment where everyone makes a con-

scious effort to maintain a low profile. During the day, he is one of the top engineers working on the Arrow missile project. At night, he learns in a kollel.

“I dress like the chareidi person that I am, all day long,” he says. “Very often, when I try to enter the factories where I work, the guards ask me for ID. People who don’t know me can’t understand what a chareidi Jew is doing here. After they learn who I am and what position I hold, they immediately apologize.”

The Mezuzah’s Merit Mr. Deutsch has been working on the Arrow missile projects, in the defense theater of Israel Aerospace Industries (IAI) for seventeen years. During the Gulf War, he was responsible for research and development of the missile’s electro-optic sensor, which identifies and targets an incoming enemy missile. He spends days and nights in this complex.

“This work demands a lot of personal sacrifice,” Mr. Deutsch tells us. “Some-

times we have a deadline and we suddenly run into problems. When that happens, I have to forgo Torah learning, and on rare occasions, even davening with a minyan. But I have no other choice, as we are involved in *pikuach nefesh*.”

The system Mr. Deutsch is currently in charge of is called “Green Pine” — a radar system the size of a semi-trailer produced by Elta, a defense subcontractor for the Arrow missile. The Green Pine radar detects an incoming missile and alerts the operations room. Then an Arrow missile is fired, to intercept and destroy the threat before it can hit the ground. There are six missile tubes in each launcher, and each missile can be fired toward a different target. The electro-optic sensors track the incoming missiles in mid-flight, allowing the Arrow missiles to “chase” them. Then, one of two things can happen. Either the two missiles will collide, sending the enemy missile off course, or the Arrow will impact the enemy



Photo credit: Yair Cohen

While his coworkers wait in suspense for the results of the Arrow missile test flight, Mr. Yeshayahu Deutsch gives his Gemara class and prays that the outcome will be successful. In this exclusive, Mishpacha's Aharon Granot interviews Mr. Deutsch, one of the leading engineers in charge of the Arrow's development, and an alumnus of Ponevezh Yeshivah in Bnei Brak and its illustrious rosh yeshivah, Rav Menachem Man Shach, ztz"l.

missile with enough force to detonate it in mid-air. If the interception is not successful, Patriot missiles are available at the same launch sites.

Sometimes, when Mr. Deutsch is faced with a work-related problem, he consults with *rabbanim*. He used to consult with Rav Shach, *ztz"l*, for guidance, but now, his teacher and spiritual mentor is Rabbi Nissim Karelitz, *shlita*, the head of the Bnei Brak *beis din*.

"The Arrow missile is a lethal weapon, which, when used correctly, can help save Jewish lives. That is where the opinion of a rabbi plays a part in their design and production," says Mr. Deutsch.

"His door is always open to me. He knows what I do and what kind of questions I ask. When I arrive, everyone in the room is asked to leave, since many details of my work are top secret. Unfortunately, I cannot reveal every detail even to the *rav*. My superiors at work know that I consult with him on various matters and they advise me how to pre-

sent my questions without saying anything I shouldn't. The solutions the *rav* has given me have proven to be very useful."

During the most recent test flight two weeks ago which was heralded as a success in the media, additional capabilities of the Arrow were analyzed, including how well the missile performs versus ballistic missiles using non-conventional materials, and at different speeds. All of the experiments were planned according to innovations discovered in the weaponry of enemy nations. Following this successful test flight, the United States, Israel's partner in the project, has agreed to extend its funding for another five years.

"It takes a lot of time and effort to prepare for such tests," says Mr. Deutsch. "You must understand," he explains, "when you are designing an aircraft, you send a pilot up with the plane to test it out. He returns and tells you what needs to be improved or changed.

With a missile, that is impossible. If you make a mistake in the design or capabilities of the missile, it can explode during the experiment, and you have to start from scratch. The money spent is gone, and your reputation is damaged.

"Therefore, when planning a test flight, everything has to be meticulously thought out and planned, down to the smallest detail. Everything has to be checked, and rechecked, again and again. Sometimes when I sign documents authorizing that everything about the experiment is in order, my hand literally shakes. Don't forget that even the space shuttle which exploded with Israeli astronaut Ilan Ramon aboard, was designed by intelligent, experienced people, who thought that everything was going to be fine.

"You need a lot of *siyata d'Shmaya*. When I came to work the day after the most recent test, my boss told me that the complicated experiment had been successful in the merit of the *mezuzah* we

FROM START TO FINISH

It all began during the Gulf War. Iraq fired Scud missiles into Israel and the Ministry of Defense, after seeing how Patriot missiles were not the exclusive answer to Israel's defense needs, decided that it was crucial to develop a system to defend Israel against long-range ballistic missiles.

Since the cost of developing and operating such a system was exorbitant, Israel Aerospace Industries attempted to interest the United States in footing the bill for the first Arrow missile project. The American government agreed to fund almost three-fourths of the project, with the Israeli government covering the balance. Nobody knew if it would even be possible to produce the kind of missile that had been designed in theory.

"The initial design on paper," says Mr. Deutsch, "was a missile shot from a cannon that flew at the speed of light. Its job was to locate the incoming ballistic missile, and destroy it. For that to happen, the intercepting missile had to reach a very high altitude. In the initial experiments, there were a number of failed attempts, but there were also a number of successful hits."

The partial success of Arrow I led to the development of Arrow II.

"The computerized defense system we have today identifies and locates all sorts of enemy threats. It sends the information to a central intelligence center, where the weapons' capabilities are analyzed, and then we try to create viable solutions. The experiments are not always successful, but when a missile proves to be useful, the Army buys it. Usually, our rate of success is ninety percent. One of our missiles was tested in the United States against a real Scud, and it succeeded in putting the Scud out of commission. A successful experiment gives us the motivation to keep working hard to turn more of our ideas into reality."

had put up at the factory entrance just the day before. Even my colleagues at work understand that in the end, everything depends on Hashem's will."

Just Like Erev Rosh HaShanah When the Ministry of Defense orders a missile system like the Arrow into production, engineers must take into account all of the parameters involved in the intended use of the weapon. They design all of the electronic connections and the type of motor that will activate the missile. Hundreds of engineers are in-



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— Yeshayahu Deutsch

involved in a project of this scope, as well as sub-contractors within and outside of Israel. Each one has a role to play, within his particular area of expertise.

After the planning stage is completed, everyone meets to figure out how to launch the missile and how it will “behave.” Before the real missile is tested, a “dry run” is conducted in a simulation chamber. All of the wires are connected, an “enemy missile” is launched, and everyone waits to see if the Arrow missile detects it. Does it work? Is everything functioning as expected? All of this must be done before the real test takes place.

Most of the missile experiments are conducted on the beach at the Palmachim Air Base, which is far from any residential areas. When the missile is fired, parts of it fall back to the ground and it is safest if they fall into the ocean. Hundreds of people take part in such an experiment. They include reserve-duty soldiers from the Navy and the Ar-

mored Corps, among others, and of course, the Americans. The United States funds a portion of the Arrow missile system project and government representatives are present during every experiment. A new test is conducted every three years and everyone involved must follow a strict timetable.

“Sometimes, a problem is discovered with one of the missiles,” Mr. Deutsch explains. “Since it is not possible to alter the timetable, the missile is sent back to us and we have to work hard and fast to solve the problem. Sometimes, we figure out what is wrong in just half an hour. Other times, it can take us days or weeks to make the needed repairs. I daven for us to have *siyata d’Shmaya*, and find the root of the problem quickly. Otherwise, I will end up missing a Torah class or even praying with a minyan. Usually, my prayers are answered,” he says.

On the day of such a test flight, the mood in the halls of the factory look like the streets of Bnei Brak on *erev Rosh HaShanah*. Everyone working on the project is extremely tense. It is the “day of judgment” for the Arrow. That is when Mr. Deutsch moves to center stage. All of the computers are shut down and files are closed and put away in cabinets. Only one book is open — Mr. Deutsch’s *Tehillim*. He recites the verses aloud and his colleagues repeat the words after him and then answer, “Amen,” even the ones who claim that the success of a test is all a matter of hard work and brainpower.

“Once, before an especially complicated experiment that was to involve a lot of different components, and which we doubted would be successful, I went to Rav Kanievsky and asked for a *brachah*.”

Did he give you one?

“He did. And the experiment was a success. After I heard his blessing, I was totally at ease. I had no doubts that everything would work out for the best.”

On another occasion, a scheduled experiment was more complex than any that had ever preceded it. Everyone held their breath and chewed on their fingernails, waiting to see what the outcome would be. Mr. Deutsch decided that this time, he would not miss giving his weekly Gemara class.

“I had in mind that in the merit of the *shiur*, the experiment would be successful. I just couldn’t tell that to my students!” he relates. “Baruch Hashem, the experiment was successful beyond what anyone had imagined.”

“When I arrive, everyone in the room is asked to leave, since many details of my work are top secret. Unfortunately, I cannot reveal every detail even to the Rav. My superiors at work know that I consult with him on various matters and they advise me how to present my questions without saying anything I shouldn’t”

— Yeshayahu Deutsch

Is it possible that one day there will be a missile that will be able to provide one hundred percent protection to the citizens of Israel, in the event that we are attacked?

“There can never be such a missile. Our true protection comes from HaKadosh Baruch Hu. *‘Im Hashem lo yishmar ir shav shakad shomer [If Hashem doesn’t guard a city, in vain is the watchman vigilant]’*” (Tehillim, 127:1). ■



A PARSHAH LESSON FOR EMPLOYEES

After studying for years in a yeshivah and in the kollel of Yeshivas Itri, Yeshayahu Deutsch, a native of Bnei Brak, enrolled in a program in the Jerusalem College of Technology (JCT) – Lev Institute. “When I started looking for a job, I saw an advertisement in a newspaper, that Israel Aerospace Industries was interested in hiring a computer engineer. I misunderstood the ad, and thought they were looking for electronic engineers, which is my field. I made an appointment for an interview, and once I realized my mistake, I asked them to interview me anyway. ‘Perhaps you will need someone with my skills in the future,’ I told them. The man who interviewed me eventually became my department manager. He spoke with me for just a few minutes, and decided on the spot to hire me to work with him. That is how, through *Hashgachah pratit*, I was accidentally hired.

“After the interview, I had to undergo a security check. They asked me if I had a

rabbi. I told them that my rabbi was the *rosh yeshivah* of Ponevezh, the *gaon* Rabbi Elazar Menachem Man Shach, who was still alive at the time. They warned me not to discuss anything about my work with him. I promised not to reveal any of the country’s secrets, but they knew that I would be seeking his advice on a regular basis. They briefed me on how to ask relevant questions, without giving too much information. I still adhere to that method when I approach Rav Nissim Karelitz with my questions.”

Mr. Deutsch is the father of nine children and is now also a grandfather. He gives a Gemara class twice a week — one in Ramat Gan and the other in Petach Tikvah. Graduates of JCT attend those *shiurim*.

“The managers of the factory, headed by Uri Sinai, along with the manager of human resources, David Applebaum, are uncommonly accepting of their reli-

gious and chareidi employees,” Mr. Deutsch emphasizes. “The meals here are *kosher l’mehadrin*, the meat is *glatt* and we have a *mashgiach* here all the time. Even when events are scheduled outside of the factory, those of us who request it are provided with *kosher l’mehadrin* food. We have a minyan for Minchah on most days. When the rabbis announced that we would say the *selichos* of Yom Kippur Katan, on the day before Rosh Chodesh, the factory managers allowed 150 observant employees an extra hour off from work to complete the *selichos* and Minchah with a minyan.”

Once a week, after work hours, the chareidi engineer gives a lecture on *parshas hashavua* for employees. Most of the men who come to the *shiur* are not religious. The factory management provides transportation for Mr. Deutsch to get home after his *shiur*, as he misses the regular bus ride on that day.