INTRODUCTION

"If our data, correlations and conclusions are valid, then what has emerged is a rather new type of cigarette, represented by Marlboro and Kool, with high nicotine 'kick', burley flavour, mildness to the mouth, and increased sensation to the throat, all largely the result of higher smoke pH. There is evidence that other brands, which are selling well also, have some of these attributes, particularly increased 'free' nicotine impact."

Claude Teague, R.J. Reynolds Tobacco Co., 14th August, 1973, Implications and Activities Arising from Correlation of Smoke pH with Nicotine Impact, Other Smoke Qualities, and Cigarette Sales. Minn Trial Exhibit 13155.

From their own internal documents, as well as from scientific study, it has become clear that the tobacco companies have for decades intentionally marketed their products to kids to recruit new smokers as replacements for those customers who quit – or die. Having addicted most of their customers as kids, the companies continue efforts to sustain that addiction and discourage quitting. Much of their success has been rightfully attributed to sophisticated marketing campaigns, including the infamous Joe Camel campaign, the Virginia Slims *You've Come a Long Way Baby* campaign, and of course the Marlboro Man, which *Advertising Age* in 1999 named the No. 1 Ad Icon of the 20th Century – even ahead of Ronald McDonald. Along with pricing strategies and massive payments to retailers to ensure that tobacco products are prominently displayed in retail outlets, these campaigns have helped to addict generations of Americans to products that take a devastating toll on public health.

What is equally clear but less understood by the public is the degree of precision with which the tobacco companies design their products to recruit new youth smokers, create and sustain addiction, and discourage smokers from quitting. The companies spend huge sums to research virtually every element of the design so their products achieve these goals. As the quote above illustrates, tobacco products are far from simple tobacco leaf rolled in paper or otherwise packaged. For many decades they have been highly engineered nicotine delivery devices, finely tuned to appeal to the taste, feel, smell and other sensations of the consumer. Every aspect of product development, from its crudest elements through its final packaging, is thoroughly researched and controlled by the tobacco companies, with no government oversight. Operating without any regulation, the companies are free to make product design decisions based solely on what will benefit their bottom lines, with no regard for the impact on health.

In recent years, the tobacco companies have introduced a number of new and novel tobacco products in their ongoing efforts to maximize their profits. Without U.S. Food and Drug Administration (FDA) regulation of these new and existing products, the companies remain free to design and alter them with no regard for public health. What is even more alarming than what we do know about how companies design their products is what we do not know, and with no regulation, we have no way of finding out.

This report details just a few of the ways the companies design products to attract new youth smokers, create and sustain addiction, and discourage smokers from quitting. It then describes many of the new products designed to achieve those same objectives. Finally, it describes why legislation giving the FDA the authority to regulate tobacco products and their marketing is critical to reducing the death and disease toll from tobacco use.

Chapter 1: The Critical Role of Product Design

The characteristics of tobacco products are no accident. Everything about them is designed with an explicit purpose. While smoking any form of tobacco is deadly, virtually everything the tobacco companies do to make the product appealing, addictive and easy to use has the potential to affect the harm caused by the product. For example, making the smoke less harsh and less irritating not only makes it easier for kids to start smoking, but also produces more efficient nicotine absorption and greater addictive impact by enabling deeper lung inhalation; in turn, this can result in more severe forms of lung cancer.

There are a number of design features that can affect the impact of the product on the consumer, including flavorings, other additives, how the tobacco is treated, the filter, and even the paper, adhesive, inks, and packaging. Additionally, the act of combustion has a significant impact on the toxicity of the cigarette smoke actually inhaled by the smoker.[1] For instance, the companies claim that many of their additives are safe for consumers because they are considered safe when used in food processing. What they fail to disclose is that inhaling these compounds after they have been lit on fire -- not an approved use in food -- changes the effect of these ingredients on health. Burning chocolate produces carcinogens not present in its uncombusted form. There is no evidence that these considerations are given any weight by tobacco companies as they strive to attract and retain customers.

The chart below illustrates how just a few of the many aspects of product design serve a unique purpose not disclosed or apparent to consumers, from enhancing nicotine delivery to making the smoke taste better or milder and easier to inhale.[2] Of course, many of these elements also make the product more harmful.

Design feature	Intended Affect
Ammonia	Changes chemical composition of nicotine in ways that increase speed and efficiency of nicotine absorption
Acetaldehyde	Increases addiction potential by interacting with nicotine
Eugenol and Menthol	Numb throat so the smoker does not feel as much throat irritation and can inhale more smoke more deeply
Glycerin	Enables deep lung exposure
Cocoa	Allows smoke to pass more easily and deeply into the lungs
Sugars and chocolate	Make smoke seem milder and easier to inhale; Make cigarettes more appealing to children and first time users
Cigarette filter technology	Reduces certain throat burning sensations; ensures that nicotine is delivered in a form that can be inhaled deep into the lung
Ventilation holes	Increase the amount of free nicotine which increases the addictiveness of the nicotine and cheats FTC smoking machine testing for tar and nicotine ratings

Other features of the product are also highly engineered:[3]

- Ignition propensity and burn rate (ease of lighting a cigarette and speed at which it burns) are controlled to help control nicotine dosing and make cigarettes convenient to use.
- Smoke particle size is engineered to facilitate efficient inhalation of smoke deep into the lung.

- Smoke temperature and harshness are controlled to make it easier to take up smoking, to inhale deeply and to provide smoother smoke that misleads the smoker into assuming it is not as harmful.
- Smoke and ash color are controlled with chemicals in the tobacco and paper to make the process as neat and attractive-appearing as possible.
- Still other chemicals are added that prolong shelf life and control humidity, which, in turn, help control nicotine dosing and smoke sensations.

Tobacco Companies Design Products Specifically to Recruit New Youth Smokers

For decades, tobacco companies have recognized the importance of the youth market to their survival and have focused their research and product design efforts to meet the needs of this market. As Claude Teague, a chemist for R.J. Reynolds (RJR), noted in 1973:

> "Realistically, if our Company is to survive and prosper, over the long term, we must get our share of the youth market. In my opinion this will require new brands tailored to the youth market. … Several things will go to make up any such new "youth" brands, the most important of which will be the image and quality – which are, of course, interrelated. The questions then are: What image? And What quality? Perhaps these questions may best be approached by consideration of factors influencing **pre-smokers to try smoking, learn to smoke, and become confirmed smokers** (emphasis added)."[4]

This 1973 RJR document (*Some Thoughts About New Brands of Cigarettes for the Youth Market)* epitomizes how tobacco companies consciously design products to attract youth smokers and teach them how to smoke until they become addicted customers. Every decision regarding product manufacture and design is made following extensive research into the impact it will have on the user's experience. The tobacco companies' own documents demonstrate that they make considerable efforts to determine what characteristics are most likely to attract new customers and to make it easier for new users to tolerate tobacco smoke.

The Teague document details a number of product features that make smoking more tolerable for beginning and learning smokers. For example, it discusses methods of reducing harshness, making the flavor bland since new smokers don't like the taste of the smoke, and improving the "mouth feel" by reducing negatives like hotness and dryness. It even addresses how the cigarette should be designed to make lighting it easy for the "learner." Some of the specific product features outlined in the memo include the following:[5]

Research Planning Memorandum on Some Thoughts About New Brands of Cigarettes for the Youth Market

- Nicotine level of 1.0-1.3 mg/cigarette
- Bland smoke to address "low tolerance for smoke irritation" of "beginning smoker[s] and inhaler[s]"
- Nicotine absorption minimized "by holding pH down"

- Suggests 100 mm “to facilitate lighting”
- Tar content of 12-14 mg/cigarette to achieve desired taste and “visible” smoke
- “Reasonably firm” rod

One of the best examples of how these design features are used to recruit new smokers is the Joe Camel campaign. While most Americans are familiar with the egregious marketing campaign targeted at kids, they are unaware that a key element of the effort to attract kids was the design of the product itself. In tandem with the marketing campaign, these efforts were a big success for RJR and a disaster for our kids.

In the early 1980s, Philip Morris’ Marlboro cigarettes had become the most popular cigarette among younger smokers. After carefully examining Marlboro, RJR concluded the one reason for Marlboro’s success was that Philip Morris had figured out how to deliver nicotine more effectively and more smoothly. RJR, looking to compete with Philip Morris for this market, instituted a number of design changes to Camel cigarettes in order to appeal to younger smokers. After extensive consumer testing and product analysis, RJR introduced cigarettes that were smoother and less harsh, making them easier to smoke. Nicotine levels were also increased during this time period. The introduction of Camel’s “Smooth Character” advertising campaign, which focused on the smoothness of the product, coincided with these design changes.[6]

Following these product changes, Camel’s share among 18 year olds increased dramatically from 2.5 percent in 1985 to 14 percent in 1993. By 1993, Camel had been transformed into a young adult smoker (a tobacco industry euphemism for kids) brand.[7]

Flavorings

As early as the 1970s, the tobacco companies were discussing the “benefits” of sweet flavors. These flavors are used to affect the taste as well as the harshness of the product. A 1974 summary of a meeting held at RJR discussed cigarettes designed for beginning smokers, noting that such a cigarette should be “*low in irritation and possibly contain added flavors to make it easier for those who never smoked before to acquire the taste of it more quickly.*”[8] Advisors to Brown & Williamson also reviewed new concepts for a “*youth cigarette,*” including cola and apple flavors, and a “*sweet flavor cigarette,*” stating, “*It’s a well-known fact that teenagers like sweet products. Honey might be considered.*”[9]

Other industry statements reveal how flavors are used to attract smokers:

> “Although each tobacco manufacturer carefully guards the secrets of his casing (and flavor) formulas, it is well known that casings for smoking products often contain sugar, liquorice, cocoa, or chocolate liquor and sometimes natural extracts. Of these, liquorice deserves special mention. Just as sugar is used in ‘casing’ the tobacco to mellow and smooth the smoke, liquorice is used as an adjunct to boost the sweetness of tobacco products. The taste of liquorice to the smoker is that of a mellow sweet woody note which, at proper use levels, greatly enhances the quality of the final product.”[10]

> "Although by no means conclusive, the results now presented lend some support to the claim that treatment of tobacco with cocoa butter reduces the harshness of the smoke."[11]

Both licorice and cocoa, when burned, produce carcinogens.

The tobacco companies' success in using menthol cigarettes to target African American kids is exemplified by the disproportionate number of young blacks who smoke menthol cigarettes. Not only does menthol numb the throat to allow deeper inhaling, the companies know menthol is attractive to their African American targets:

> "Young blacks have found their thing, and it's menthol in general and Kool in particular."[12]

It is hardly surprising then that 80 percent of 12- to 17-year-old black smokers choose Newport, the leading menthol brand, compared to just 16 percent of young white smokers.[13] Again, these product design decisions can have a terrible impact on health. Menthol cigarettes have higher carbon monoxide concentrations than non-menthol cigarettes and may be associated with a greater absorption of nicotine.[14] Moreover, research indicates that mentholated cigarettes may increase the risk of both lung and bronchial cancer by promoting lung permeability and diffusability of smoke particles.[15] African Americans are more likely to develop and die from cancer than persons of any other racial or ethnic group. Lung cancer is the second most common cancer in both African American men and women and it kills more African Americans than any other type of cancer.[16]

The cigarette companies have not been alone in their pursuit of product designs to attract new customers from the ranks of kids. Smokeless (or spit) tobacco companies, particularly the U.S. Smokeless Tobacco Company (UST), have a long history of creating new products that appeal to kids and marketing them aggressively to children. According to internal company documents, UST developed a strategy some time ago for hooking new smokeless tobacco users, which means kids. One document states:

> "New users of smokeless tobacco – attracted to the product for a variety of reasons – are most likely to begin with products that are milder tasting, more flavored, and/or easier to control in the mouth. After a period of time, there is a natural progression of product switching to brands that are more full-bodied, less flavored, have more concentrated 'tobacco taste' than the entry brand."[17]

Following this strategy, in 1983 to 1984, UST introduced Skoal Bandits (in pouches) and Skoal Long Cut, designed to "graduate" new users from beginner strength to stronger, more potent products. Both the pouches and the long cut tobacco made make it easier for beginning users to handle the product in the mouth. A 1985 internal UST newsletter indicated the company's desire to appeal to youth: "Skoal Bandits is the introductory product, and then we look towards establishing a normal graduation process."[18] In 1993, cherry flavoring was added to UST's Skoal Long Cut, another starter product (see below).[19]

Tin of Cherry Skoal (2007)

A former UST sales representative revealed that, **"Cherry Skoal is for somebody who likes the taste of candy, if you know what I'm saying."**

"Juiced Up: How a Tobacco Giant Doctors Snuff Brands to Boost Their 'Kick,'" *The Wall Street Journal*, October 26, 1994.

Tobacco Companies Design Products to Create and Sustain Addiction

Perhaps nothing is more important to the tobacco companies than controlling nicotine delivery, and they have engineered their products to do this effectively and efficiently. Their own documents make it clear that nicotine delivery and the resulting addiction are the key to their success.

> "We are basically in the nicotine business. . . . Effective control of nicotine in our products should equate to a significant product performance and cost advantage."[20]

> "I believe the thing we sell most is nicotine."[21]

> "I believe that for the typical smoker nicotine satisfaction is the dominant desire, as opposed to flavor and other satisfactions."[22]

Not only do the companies recognize the importance of nicotine, we have also learned, through tobacco industry documents, just how much more the industry knows than it discloses, and how much it knows about design and ingredients to heighten addiction risk and keep smokers smoking. U.S. District Court Judge Gladys Kessler's Final Opinion from August 17, 2006, in *United States v. Philip Morris* included abundant evidence showing that tobacco companies controlled nicotine levels in cigarettes to ensure that smokers become addicted and stay addicted. From Judge Kessler's Final Opinion:

> "1366. Defendants have designed their cigarettes to precisely control nicotine delivery levels and provide doses of nicotine sufficient to create and sustain addiction."[23]

> "1368. Every aspect of a cigarette is precisely tailored to ensure that a cigarette smoker can pick up virtually any cigarette on the market and obtain an addictive dose of nicotine."[24]

Addition of Dangerous Chemicals to Enhance Nicotine Delivery and Addiction

The addition of specific chemicals is an important example of how tobacco companies design and manufacture their products to create and sustain addiction. In particular, the

tobacco companies have used chemical additives to modify the form of nicotine delivered to the smoker and enhance the speed at which it is absorbed by the body. This all works to make the nicotine more pharmacologically potent.

Through intensive research, the tobacco companies found that adding ammonia or ammonia-based compounds in the manufacturing process alters the chemical balance of the nicotine in the cigarette smoke. Put simply, adding ammonia converts the nicotine molecules into a form often referred to as a "freebase" form of nicotine.

The freebase forms of other drugs, such as freebase cocaine ("crack"), are recognized as more addictive than the non-freebase counterparts because of the speed with which they reach the brain. Similarly, this "freebase" nicotine is more readily absorbed by the smoker, offering a faster and more intense fix of nicotine.

To some, ammonia technology, not the Marlboro Man, is what turned Marlboro from a relatively marginal brand in the 1960s and early 1970s into the world's best selling cigarette.[25] Philip Morris competitor Brown & Williamson acknowledged as much in a 1992 document: "Looking at all the technology employed in Marlboro on a world-wide basis, ammonia technology remains the key factor."[26]

In her Final Opinion, Judge Kessler found that the cigarette companies were "well aware of the particular chemical characteristics and effects of free nicotine, and undertook efforts to exploit these features."[27]

Engineering of Smoke Particle Size to Enhance Nicotine Delivery and Addiction

Another example of the tobacco companies' level of sophistication in designing their products to create and sustain addiction is the engineering of the smoke particle size. The tobacco companies produced various technologies to ensure that the smoke particles were of optimal size to facilitate efficient inhalation of the smoke deep into the lung.

Smoke particle size is critical. Indeed, particles that are too big will not be readily deposited into the lung, while smaller particles may not be transferred across the membranes of the mouth and throat (and into the bloodstream) before the smoker exhales them.[28] With an addictive substance such as nicotine, the faster the particles are delivered, the stronger their effect. In this case, one of the fastest ways of getting the nicotine to the brain is through the lungs.[29]

As early as the 1950s, Philip Morris understood that particles that were too big would not be readily deposited into the lungs. An internal research document states that "<u>increasing</u> the size of smoke particles to get them to a size range which will go into the buccal cavity but <u>not</u> into the lungs [underlined words in original document]... would allow the smoker to taste the smoke but not get a large mass of smoke in the lungs."[30]

However, by hiring specialized physicists to engineer the size of the tobacco particles, the cigarette companies made sure that a higher proportion of particles would, in fact, get deep into the lungs. The companies devised a number of ways to design the product to deliver the optimum particle size. The moisture content of the cigarette,

glycerin compounds, air ventilation holes and the physical and chemical make-up of the cigarette filters could all be engineered to control the particle size of nicotine in cigarette smoke.[31]

The engineering of particle size is yet another example of how the tobacco companies purposefully design their products without regard to their devastating impact on public health. In this case, the manipulation of particle size may contribute to increased lung cancers by enabling deep lung exposure to the smoke particles.[32] In the absence of regulation, tobacco companies are free to continue to design and engineer their products to maximize addictiveness without regard for public health.

Tobacco Companies Design New Products with Unproven Claims to Discourage Quitting

In addition to making changes to existing products, tobacco companies have a history of introducing new products to convince smokers that they do not need to quit to reduce their health risk.

Development of "Light" and "Low Tar" Cigarettes

"Light" and "low-tar" cigarettes can be considered a seminal example of fraudulent "harm reduction" products designed to address smokers' health concerns but to not really reduce their health risks. As the public began to understand the link between smoking and disease, cigarette companies, fearing a massive loss in sales, scrambled to develop products that would ease consumers' fears about the health effects of smoking. This 1977 quote from the internal files of Brown & Williamson illustrates the industry's approach:

> "All work in this area should be directed towards providing consumer reassurance about cigarettes and the smoking habit. This can be provided in different ways, e.g. by claimed low deliveries, by the perception of low deliveries and by the perception of 'mildness'. Furthermore, advertising for low delivery or traditional brands should be constructed in ways so as not to provoke anxiety about health, but to alleviate it, and enable the smoker to feel assured about the habit and confident in maintaining it over time."[33]

To reassure consumers, the companies introduced "low-tar" and "light" cigarettes, which took their name from the fact that when measured by smoking machines, these cigarettes delivered less tar and nicotine.

A primary design feature of these cigarettes is ventilation holes – tiny holes in the filter paper. Diluting the smoke with the air reduces the tar and nicotine levels and hence the levels that are measured by the smoking machines used to determine tar levels.[34] Internal tobacco industry documents show the industry deliberately designed these cigarettes to produce low yields of tar when tested by machines, knowing full well that they would be smoked differently by actual smokers seeking to maintain nicotine levels.[35] Despite knowing this, the cigarette companies marketed them as safer products. The machine levels used to market the cigarettes are different (and lower) than the actual levels experienced by the smoker.

The scientific evidence has shown that, in practice, "light" cigarettes have not produced a public health benefit and have not lowered disease risk among smokers. In November 2001, the U.S. National Cancer Institute (NCI) released a landmark study on the subject. The report confirmed that while changes in cigarette design have reduced the amount of tar and nicotine measured by smoking machines, these machine measurements do not accurately show how much tar and nicotine is actually received by the smoker. Smokers smoke "low-tar" brands differently to obtain the same amount of nicotine. Smokers block ventilation holes; inhale more deeply; take larger, more rapid, or more frequent puffs; or increase the number of cigarettes smoked per day. There is in fact no meaningful difference in exposure from smoking low-tar and regular brands, and therefore no difference in disease risk.

The NCI report concluded that "Epidemiological and other scientific evidence, including patterns of mortality from smoking-caused diseases, does not indicate a benefit to public health from changes in cigarette design and manufacturing over the last fifty years." The report noted that while "many smokers switch to lower yield cigarettes out of concerns for their health believing these cigarettes to be less risky or to be a step towards quitting...current evidence does not support either claims of reduced harm or policy recommendations to switch to these products."[36]

Rather than reducing harm, this public health fraud has discouraged quitting, with a negative impact on health. This public health disaster will continue if tobacco companies are allowed to produce and market the new generation of so-called "reduced risk" products the way they have in the past.

The "light" and "low-tar" fraud continues, as many smokers still believe that smoking these products is less harmful. Judge Kessler recognized this when she ordered the

companies to discontinue the use of terms like "light" and "low-tar" in her order.[37] The tobacco companies' desire to continue the fraud is reflected not only in the challenge to her order but in their filing of a brief to limit the order only to the products they sell in the United States.[38]

Product manipulation by the tobacco companies is never-ending in their quest to replace the hundreds of thousands of smokers who die or quit every year. While many of their efforts remain secret, the rash of new products described in the following chapter demonstrates their ongoing zeal for product innovation. These include new flavored products that appeal to youth, along with new so-called "reduced-risk" products – the latest attempt to discourage smokers from quitting. In addition, a January 18, 2008, article in *The Wall Street Journal* detailed the many new products Philip Morris has developed ostensibly for its overseas markets.[39] These include Marlboro Intense, a short but strong version of the brand, and Marlboro Mix 9, a high tar high nicotine product launched in Indonesia in 2007. Nothing prevents tobacco companies from introducing these or other new products to the American market.

Product manipulation and innovation by the tobacco companies have caused an ongoing public health disaster. Without government regulation of tobacco, this will only continue.

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